

# Serial Interface Specification of DBT3313UD

Ver1.0

| Approval | Review | Creation |
|----------|--------|----------|
|          |        |          |

Revision Table

| Rev. | Date             | Name   | Description                                 |
|------|------------------|--------|---|
| 1.00 | July 17,<br>2012 | T.Kato | 1st Release                                 |
| 1.10 | Oct 9.2012       | T.Kato | △Rev1.10 Add a Function to connect to Hulu. |
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# 1 Serial communication interface

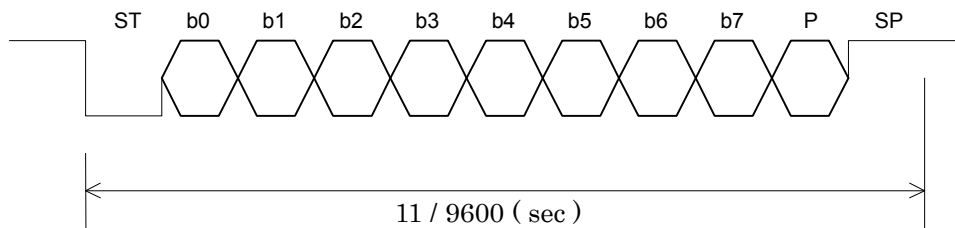
## 1.1 Physical interface

Arrangement of connector signals

| RS-232C    |          |     |
|------------|----------|-----|
| Terminal # | Signal   | I/O |
| 1          | GND      | -   |
| 2          | TxD      | O   |
| 3          | RxD      | I   |
| 4          | NC       | -   |
| 5          | S.GROUND | -   |
| 6          | NC       | -   |
| 7          | NC       | -   |
| 8          | NC       | -   |
| 9          | NC       | -   |

## 1.2 Transfer format of serial data

- Interface : As per RS-232C or RS-422A
- Communication system : Half-duplex communication
- Data transfer mode : Start stop synchronization
- Transfer rate : 9,600bps
- Start bit ( ST ) : 1 bit
- Data bit ( b0-b7 ) : 8 bits
- Parity ( P ) : Even number
- Stop bit ( SP ) : 1 bit
- Transfer data : ASCII code
- Control characters : STX (02h)  
ETX (03h)  
NAK (15h)



### 1.3 Command format and answer format

This unit shall be based on commands each of which consists of a data row ( some commands are without a PC ) composed of command codes ( CC ) and parameter codes ( PC ) . The transmitting station shall be designed to send block check characters ( BCC ) following ETX, with the data row enclosed in STX ( text start : 02h ) and ETX ( text termination : 03h ) . The receiving station shall regard receipt of BCC as the completion of command reception when it has received STX.

Here are the formats.

Commands : <STX> <CC> <PC0> <PC1> <PC2> <-----> <PCn> <ETX> <BCCH>  
<BCCL>

STX (Start of TeXt) : 02h  
 CC (Command Code) : Command code  
 PC (Parameter Code) : Defined for each command  
 ( contents and number of parameters )  
 ETX (End of TeXt) : 03h  
 BCC (Block Check Character) :

$CC + PC0 + PC1 + PC2 + \text{-----} + PCn + ETX = XYh$   
 (Each of X and Y is 4 bit long) X , Y=0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F  
 BCCH ( high-level byte ) = X as converted to an ASCII code  
 BCCL ( low-level byte ) = Y as converted to an ASCII code

Answers : <STX> <RC> <AC> <PC0> <PC1> <PC2> <-----> <PCn> <ETX> <BCCH> <BCCL>

STX (Start of TeXt) : 02h  
 RC (Reply Code) : Reply code (=Command code)  
 AC (Answer Code) : Answer code  
 PC (Parameter Code) : Defined for each command  
 ( contents and number of parameters )  
 ETX (End of TeXt) : 03h  
 BCC (Block Check Character) :

$RC + AC + PC0 + PC1 + PC2 + \text{-----} + PCn + ETX = XYh$   
 (Each of X and Y is 4 bit long) X , Y=0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F  
 BCCH ( high-level byte ) = X as converted to an ASCII code  
 BCCL ( low-level byte ) = Y as converted to an ASCII code

## 1.4 Protocol for data transmission and reception

This unit is based on half-duplex communication. The unit shall therefore transmit commands and receive answers according to the following procedure.

### 1.4.1 Basic procedure

- 1) The host shall select commands for this unit and transmit them to this unit. Command interval time is MIN 40 $\mu$ sec.
- 2) Having issued a command, the host shall receive an answer from this unit, then issue the next command.
- 3) The host shall analyze the RC, AC, and PC as answers given and decide whether the command has been normally executed.
- 4) The host shall give an answer to a command that gives operational instructions, then issue a status request command, and decide whether this unit has finished operating with regard to the command that gives operational instructions.
- 5) The time from the start of command transmission to the end of command transmission should be max 40 msec.
- 6) The time from the completion of command transmission to the start of answer-back is MAX.2sec.
- 7) This unit cannot receive any commands for about\_5 seconds after the power switch is turned on.

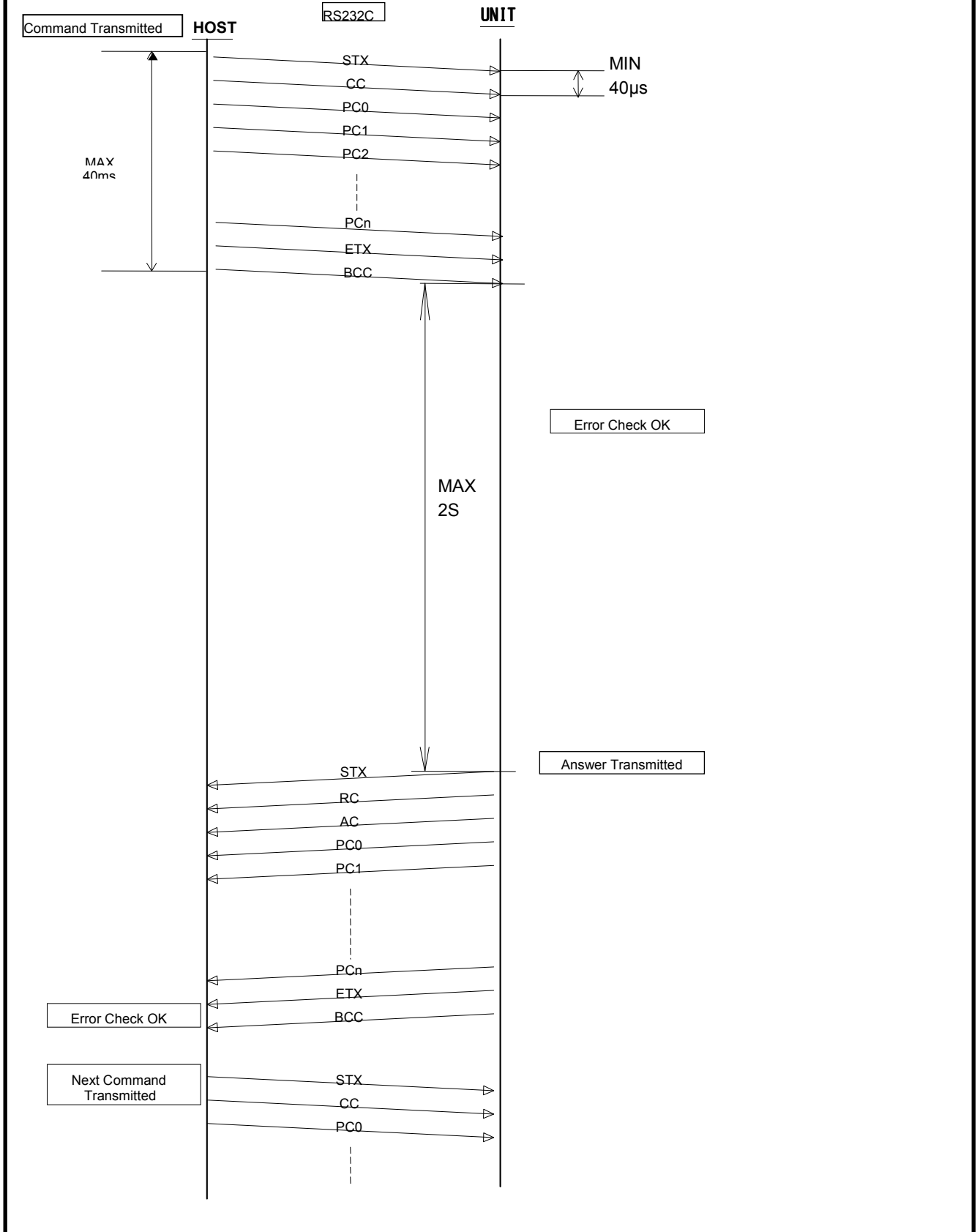
### 1.4.2 Communication errors

- 1) Having received a command, which results in a communication error ( overrun, framing, or parity error ), this unit shall give NAK ( 15h ) . ( MAX 80ms from the start of command transmission )
- 2) If the host has received NAK from this unit, it shall retransmit the command that it has transmitted immediately beforehand.
- 3) Having received an answer, which results in a communication error ( overrun, framing, or parity error ), the host shall respond with NAK.
- 4) If it has received NAK from the host, this unit shall retransmit the answer it has transmitted immediately beforehand. ( MAX 40ms)
- 5) When there is no answer from the unit within 6s, the host shall retransmit the command.

### 1.5 Command / Answer sequence

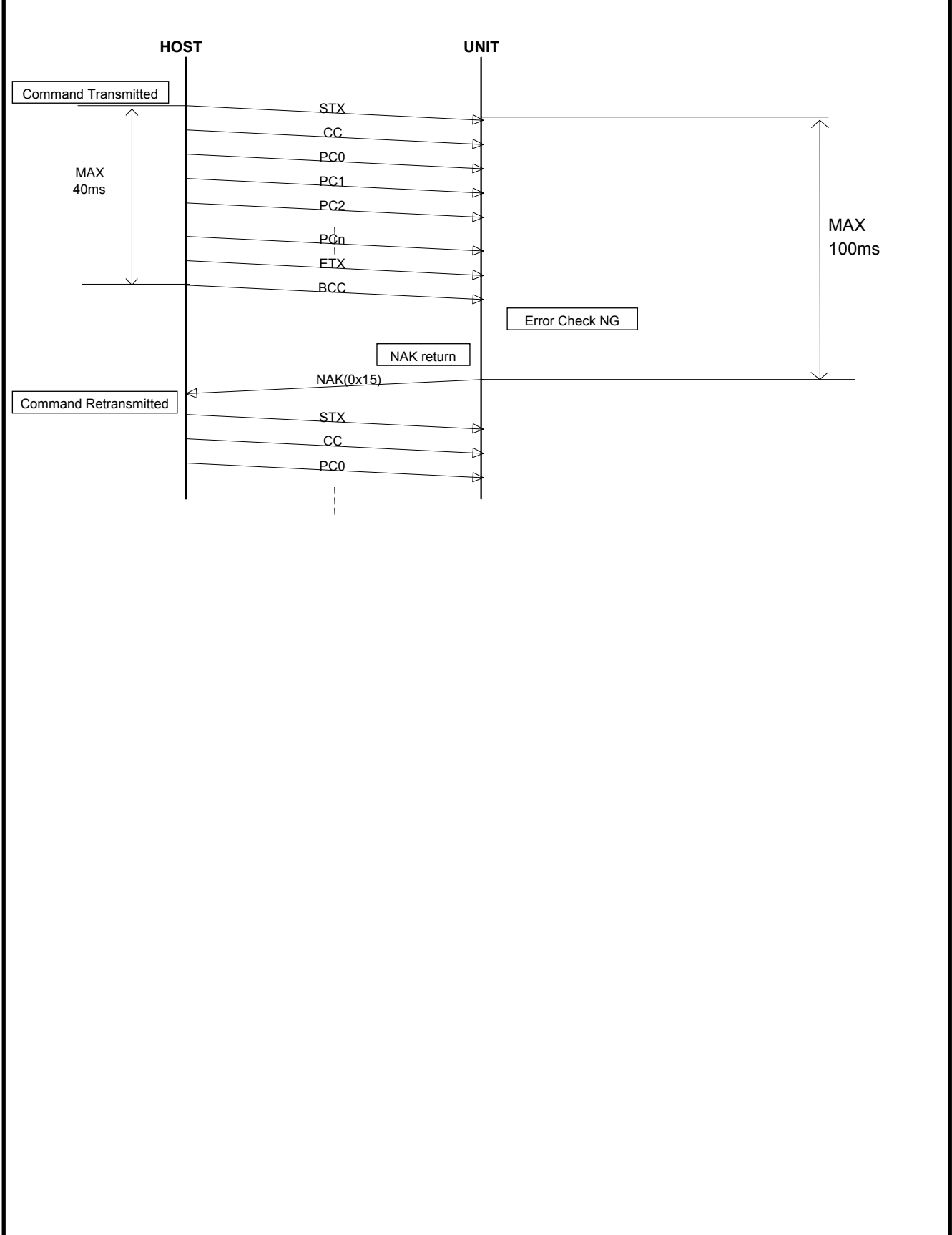
Shown below are the command sequence and the answer sequence of this unit.

- 1) When a command is normally received ( UNIT ) and an answer is normally received ( host ) with an answer parameter

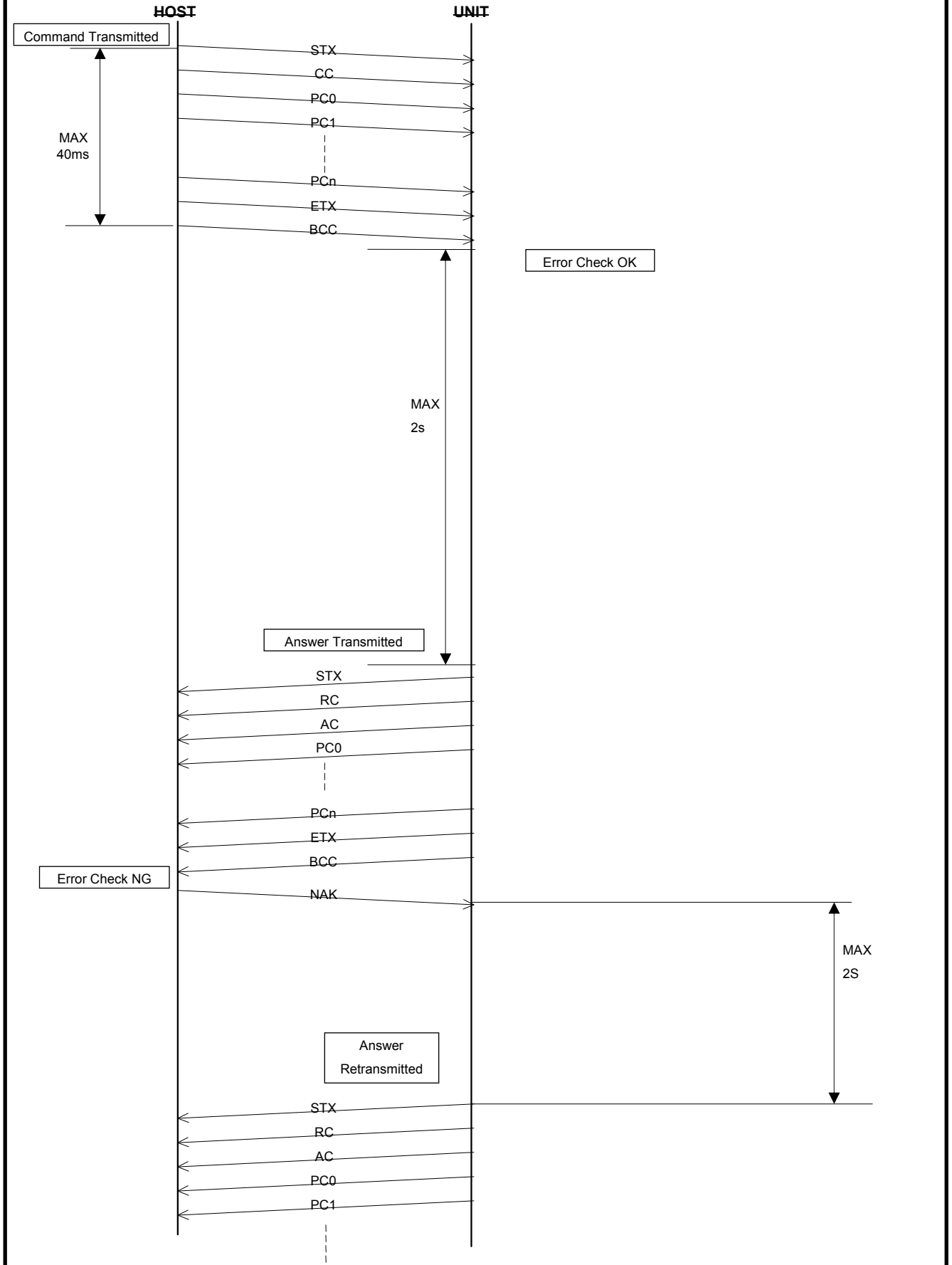




- 2) When a command is abnormally received ( with or without an answer parameter )
- ex) An uncertain command code was received.
  - 1<sup>st</sup> data is not STX(0x02).
  - 10<sup>th</sup> data is not ETX(0x03).
  - BCC(block check character) is wrong.



3) When a command with an answer parameter is normally received ( UNIT ) and an answer is abnormally received ( host )



## 1.6 List of command codes

Here is a list of command code types.

2Xh: POWER control command

**3Xh**: Command related to the acquisition of player information (such as status and name)

4Xh~5Xh: Operation instruction command to the player

61h~7Xh: Enhanced Operation instruction command to the player

| No. | Command                        | Code (ASCII) | Operation   |
|-----|--------------------------------|--------------|---|
| 1   | Power ON                       | 20h ([SP])   | Power-on request from the standby state                                     |
| 2   | Power OFF                      | 21h (!)      | Power-off request   |
| 3   | Request System Status          | 30h (0)      | Acquires system status<br>( such as the entire player and transfer unit ) . |
| 4   | Request CPU Version            | 31h (1)      | Acquires the CPU version.   |
| 5   | Play                           | 40h (@)      | Starts playback.  |
| 6   | Stop                           | 41h (A)      | Stops playback.   |
| 7   | Pause                          | 42h (B)      | Requests a pause.   |
| 8   | Skip                           | 43h (C)      | Moves to another group or title or chapter or track                         |
| 9   | Slow /Search                   | 44h (D)      | Scan  |
| 10  | Setup                          | 45h (E)      | Common procedures of initial setting  |
| 11  | Top Menu                       | 46h (F)      | Playback top menu screen  |
| 12  | Menu                           | 47h (G)      | Playback Menu screen  |
| 13  | Return                         | 48h (H)      | Return  |
| 14  | Audio                          | 49h (I)      | Audio setting   |
| 15  | Subtitle                       | 4Ah (J)      | Subtitle setting  |
| 16  | Angle                          | 4Bh (K)      | Angle setting   |
| 17  | Direct Select                  | 4Ch (L)      | Music search mode   |
| 18  | Cursor                         | 4Dh (M)      | Moves cursor screen   |
| 19  | Enter                          | 4Eh (N)      | Decision  |
| 20  | SACD Layer Select              | 4Fh (O)      | SACD Layer search mode  |
| 21  | HOME                           | 50h (P)      | HOME menu screen  |
| 22  | Request Firmware Update Status | 59h (Y)      | Request Firmware Update Status(DPMS)  |
| 23  | Ten Key(0-9, +10)              | 5Ah(Z)       | Ten key and Plus Ten key  |
| 24  | OPEN/CLOSE                     | 61h (a)      | Disk tray open / closing  |
| 25  | VIDEO RESOLUTION               | 64h (d)      | HDMI output format  |
| 26  | PROGRAM/DIRECT                 | 65h (e)      | Program mode setting  |
| 27  | CLEAR                          | 66h (f)      | Program Entry Track Clear   |
| 28  | CALL                           | 67h (g)      | Program Entry Track Call  |
| 29  | DISPLAY / INFO                 | 68h (h)      | Display information screen  |
| 30  | REPEAT                         | 69h (i)      | Repeat mode setting   |
| 31  | PAGE + / DVD A PAGE            | 6Ah (j)      | PAGE setting  |
| 32  | RANDOM                         | 6Bh (k)      | Random mode setting   |
| 33  | DIMMER                         | 6Eh (n)      | Dimmer setting  |
| 34  | PICTURE ADJUST                 | 6Fh (o)      | Picture menu screen   |
| 35  | PURE DIRECT                    | 70h (p)      | Pure direct menu screen & Pure direct setting                               |
| 36  | AUTO TRANSFER MODE             | 71h (q)      | Status information auto transfer mode setting                               |
| 37  | FUNCTION / COLOR               | 72h (r)      | I carry out a function peculiar to a disk                                   |
| 38  | Mode / OPTION                  | 74h (t)      | I call various functions.   |
| 39  | Aspect ratio                   | 78h (x)      | Aspect rate setting change  |
| 40  | Progressive Mode               | 75h (u)      | Progressive Mode rate setting change  |
| 41  | Firmware Update Start          | 79h (y)      | Start Firmware Update(DPMS)   |
| 42  | Search Mode / SEARCH           | 7Bh (l)      | Select title/chapter/time search mode                                       |
| 43  | Disc Layer Select              | 7Ch (l)      | Change Disc Layer Mode.   |
| 44  | Network Service                | 7Dh (})      | Change function to Network service  |

### 1.7 List of answer codes

| No. | Status     | Code (ASCII) | Description          |
|-----|------------|--------------|----------------------|
| 1   | Command OK | 20h (SP)     | Accepts the command. |
| 2   | Invalid    | 30h (0)      | Invalid command.     |

### 1.8 List of status codes

Here is a list of answer code types.

3Xh : Status of the entire system

4Xh : Status of each action mode

| No. | Status           | Code (ASCII) | Description               |
|-----|------------------|--------------|---------------------------|
| 1   | Stand-by         | 30h (0)      | Stand-by                  |
| 2   | Disc Loading     | 31h (1)      | Under disc loading.       |
| 3   | Tray Opening     | 33h (3)      | Disc tray open.           |
| 3   | Tray Closing     | 34h (4)      | Disc tray close.          |
| 4   | No Disc          | 41h (A)      | Disc not present          |
| 5   | Stop             | 42h (B)      | Stop                      |
| 6   | Play             | 43h (C)      | Under disc playing.       |
| 7   | Pause            | 44h (D)      | Playback in process.      |
| 8   | Scan Play        | 45h (E)      | Scanning in process.      |
| 9   | Slow Search Play | 46h (F)      | Slow scanning in process. |
| 10  | Setup            | 47h (G)      | Setup mode                |
| 11  | Resume Stop      | 49h (I)      | Resume stop condition     |
| 13  | Menu             | 4Ah (J)      | menu playback in process  |
| 12  | Home Menu        | 4Bh (K)      | Home menu mode            |

### 1.9 Command specification

- When this unit is set to be compatible with all commands and fails to accept a command ( due to a communication error, for example ) , it returns NAK ( 15h ) as an answer.

#### 1.9.1 Power ON

This requests a power-on from the standby state.

| byte \ bit | 7                       | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|-------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )             |   |   |   |   |   |   |   |
| 1          | Command code ( ' SP ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )         |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )         |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )         |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )         |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )         |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )             |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )     |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )      |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                       |   |   |   |   |   |   |   |
| 1          | Reply code ( ' SP ' )                             |   |   |   |   |   |   |   |
| 2          | Answer code                                       |   |   |   |   |   |   |   |
| 3~16       | Master player type<br>“ DBT-3313UD ” (ASCII CODE) |   |   |   |   |   |   |   |
| 17         | ETX ( 03h )                                       |   |   |   |   |   |   |   |
| 18         | BCCH ( high-level )                               |   |   |   |   |   |   |   |
| 19         | BCCL ( low-level )                                |   |   |   |   |   |   |   |

#### 2) Special condition

- When power condition is “STANDBY”, can accept “OPEN/CLOSE KEY”, “PLAY KEY”, and “POWER ON KEY” on the front panel and on the IR remote controller.
- I will keep two space before a model name later.

### 1.9.2 Power OFF

This requests a transfer from power-on to a standby state.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' ! ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' ! ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

#### 2) Special condition

- None.

### 1.9.3 Request System Status

When this command is received, the state of Player is answered.

Oneself send a answer without the [Request System Status]command from HOST when the state of Player changes.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' 0 ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                       |   |   |   |   |   |   |   |
| 1          | Reply code ( ' 0 ' )                              |   |   |   |   |   |   |   |
| 2          | Answer code                                       |   |   |   |   |   |   |   |
| 3          | Disc type code ( *1 )                             |   |   |   |   |   |   |   |
| 4          | Audio format code ( *2 )                          |   |   |   |   |   |   |   |
| 5          | Audio channel code ( *3 )                         |   |   |   |   |   |   |   |
| 6          | Dialog code ( *4 )                                |   |   |   |   |   |   |   |
| 7          | Subtitle code ( *5 )                              |   |   |   |   |   |   |   |
| 8          | Angle code ( *6 )                                 |   |   |   |   |   |   |   |
| 9          | Status code                                       |   |   |   |   |   |   |   |
| 10         | Play mode code ( *7 )                             |   |   |   |   |   |   |   |
| 11         | Group or Title number information (100 digits)    |   |   |   |   |   |   |   |
| 12         | Group or Title number information (10 digits)     |   |   |   |   |   |   |   |
| 13         | Group or Title number information (1 digits)      |   |   |   |   |   |   |   |
| 14         | Track or Chapter number information (1000 digits) |   |   |   |   |   |   |   |
| 15         | Track or Chapter number information (100 digits)  |   |   |   |   |   |   |   |
| 16         | Track or Chapter number information (10 digits)   |   |   |   |   |   |   |   |
| 17         | Track or Chapter number information (1 digits)    |   |   |   |   |   |   |   |
| 18         | Time mode ( *8 )                                  |   |   |   |   |   |   |   |
| 19         | Elapsed time (hour, 10 digits)                    |   |   |   |   |   |   |   |
| 20         | Elapsed time (hour, 1 digits)                     |   |   |   |   |   |   |   |
| 21         | Elapsed time (minutes, 10 digits)                 |   |   |   |   |   |   |   |
| 22         | Elapsed time (minutes, 1 digits)                  |   |   |   |   |   |   |   |
| 23         | Elapsed time (second, 10 digits)                  |   |   |   |   |   |   |   |
| 24         | Elapsed time (second, 1 digits)                   |   |   |   |   |   |   |   |
| 25         | ETX ( 03h )                                       |   |   |   |   |   |   |   |
| 26         | BCCH ( high-level )                               |   |   |   |   |   |   |   |
| 27         | BCCL ( low-level )                                |   |   |   |   |   |   |   |

(\*1) Disc type code (\*2) Audio format code (\*3) Audio channel code (\*4) Dialog code

| Code    | Disc Type       | Code    | Audio Format  | Code    | Audio Channel    | Code    | Dialog |
|---------|-----------------|---------|---------------|---------|------------------|---------|--------|
| 31h (1) | DVD VIDEO       | 31h (1) | DOLBY DIGITAL | 31h (1) | 1 ch             | 31h (1) | JPN    |
| 32h (2) | DVD AUDIO       | 32h (2) | DTS           | 32h (2) | 2 ch             | 32h (2) | ENG    |
| 33h (3) | Reserved        | 33h (3) | MPEG          | 33h (3) | 2.1 ch           | 33h (3) | FRA    |
| 34h (4) | CD-DA           | 34h (4) | LPCM          | 34h (4) | 3 ch             | 34h (4) | DEU    |
| 35h (5) | CD-ROM          | 35h (5) | PPCM          | 35h (5) | 3.1 ch           | 35h (5) | ITA    |
| 36h (6) | UNKNOWN         | 36h (6) | UNKNOWN       | 36h (6) | 4 ch             | 36h (6) | ESP    |
| 37h (7) | SACD            | 37h (7) | DSD           | 37h (7) | 4.1 ch           | 37h (7) | NLD    |
| 38h (8) | DVD VR          | 38h (8) | DD+           | 38h (8) | 5 ch             | 38h (8) | CHI    |
| 39h (9) | BDMV            | 39h (9) | DTS-HD        | 39h (9) | 5.1 ch           | 39h (9) | RUS    |
| 3Ah (:) | BDAV            | 3Ah (:) | DOLBY TrueHD  | 3Ah (:) | 6 ch             | 3Ah (:) | KOR    |
| 3Bh (;) | AVCHD           | 3Bh (;) | MP3           | 3Bh (;) | L/R (CD/VCD/MP3) | 3Bh (;) | OTHER  |
| 3Ch (<) | Web stream      | 3Ch (<) | AAC           | 3Ch (<) | R (CD/CD)        |         |        |
| 3Dh (=) | DLNA            | 3Dh (=) | WMA           | 3Dh (=) | L (CD/VCD)       |         |        |
| 3Eh (>) | AVCREC          |         |               | 3Eh (>) | UNKNOWN          |         |        |
| 3Fh (?) | External memory |         |               | 3Fh (?) | 6.1ch            |         |        |
|         |                 |         |               | 40h (@) | 7 ch             |         |        |
|         |                 |         |               | 41h (A) | 7.1ch            |         |        |
|         |                 |         |               | 42h (B) | 8ch              |         |        |

(\*5) Subtitle code (\*6) Angle code (\*7) Play mode code (\*8) Time Mode code

| Code    | Subtitle | Code    | Angle | Code    | Play Mode | Code    | Time Mode       |
|---------|----------|---------|-------|---------|-----------|---------|-----------------|
| 31h (1) | JPN      | 31h (1) | 1     | 31h (1) | NORMAL    | 31h (1) | SINGLE ELAPSED  |
| 32h (2) | ENG      | 32h (2) | 2     | 32h (2) | PROGRAM   | 32h (2) | SINGLE REMAIN   |
| 33h (3) | FRA      | 33h (3) | 3     | 33h (3) | RANDOM    | 33h (3) | TOTAL ELAPSED   |
| 34h (4) | DEU      | 34h (4) | 4     |         |           | 34h (4) | TOTAL REMAIN    |
| 35h (5) | ITA      | 35h (5) | 5     |         |           | 35h (5) | CHAPTER ELAPSED |
| 36h (6) | ESP      | 36h (6) | 6     |         |           | 36h (6) | CHAPTER REMAIN  |
| 37h (7) | NLD      | 37h (7) | 7     |         |           | 37h (7) | TITLE ELAPSED   |
| 38h (8) | CHI      | 38h (8) | 8     |         |           | 38h (8) | TITLE REMAIN    |
| 39h (9) | RUS      | 39h (9) | 9     |         |           | 39h (9) | TRACK ELAPSED   |
| 3Ah (:) | KOR      |         |       |         |           | 3Ah (:) | TRACK REMAIN    |
| 3Bh (;) | OTHER    |         |       |         |           | 3Bh (;) | GROUP ELAPSED   |
|         |          |         |       |         |           | 3Ch (<) | GROUP REMAIN    |

2) Special conditions

- When the disc does not set to DVD mechanism and disc loading process does not finish, group number, title number, track number, and chapter number are set ('0').
- When the disc does not set to DVD mechanism and disc loading process does not finish, elapsed time information are set('0').
- When power condition is "STANDBY", can accept "REQUEST SYSTEM STATUS", "POWER ON KEY", "REQUEST CPU VERSION", and "REQUEST ERROR STATUS". In case of another command, returns "COMMAND FORMAT ERROR ('1')" in the "ANSWER CODE"

Note : When you need these data, you should send this command .



### 1.9.4 Play

The unit begins to play back the disc.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' @ ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' @ ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

### 1.9.5 Stop

This stops playing back the disc.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' A ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' A ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

### 1.9.6 Pause

This pauses the disc.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' B ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' B ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

#### 2) Special conditions

- This command is valid only when the status data is Play (E) .
- This command is valid as step mode, when the status data is Pause (F) .

### 1.9.7 Skip

This selects previous track or next track.

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                     |   |   |   |   |   |   |   |
| 1          | Command code ( ' C ' )                          |   |   |   |   |   |   |   |
| 2          | Skip code ( Forward : ' + ' / Reverse : ' - ' ) |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                                     |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )                             |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )                              |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                                       | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                             |   |   |   |   |   |   |   |
| 1          | Reply code ( ' C ' )                    |   |   |   |   |   |   |   |
| 2          | Answer code                             |   |   |   |   |   |   |   |
| 3          | Group number or title number (100digit) |   |   |   |   |   |   |   |
| 4          | Group number or title number (10digit)  |   |   |   |   |   |   |   |
| 5          | Group number or title number (1digit)   |   |   |   |   |   |   |   |
| 6          | Chapter or track number (1000digit)     |   |   |   |   |   |   |   |
| 7          | Chapter or track number (100digit)      |   |   |   |   |   |   |   |
| 8          | Chapter or track number (10digit)       |   |   |   |   |   |   |   |
| 9          | Chapter or track number (1digit)        |   |   |   |   |   |   |   |
| 10         | ETX ( 03h )                             |   |   |   |   |   |   |   |
| 11         | BCCH ( high-level )                     |   |   |   |   |   |   |   |
| 12         | BCCL ( low-level )                      |   |   |   |   |   |   |   |

#### 2) Special conditions

- This command is valid only , when mode status data is Play (E) or Pause (F) .
- The unit can skip to a maximum track with Forward (+) and to a minimum track with Reverse (-) and when it goes to more than those track, the Order Track None (2) answer code is issued.

### 1.9.8 Slow /Search

This scans and plays the disc.

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                     |   |   |   |   |   |   |   |
| 1          | Command code ( ' D ' )                          |   |   |   |   |   |   |   |
| 2          | Skip code ( Forward : ' + ' / Reverse : ' - ' ) |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )                                 |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                                     |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )                             |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )                              |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' D ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | Search speed         |   |   |   |   |   |   |   |
| 4          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 5          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 6          | BCCL ( low-level )   |   |   |   |   |   |   |   |

#### Search speed

| Code    | Search Speed     |
|---------|------------------|
| 31h (1) | SLOW X 1/8 (FWD) |
| 32h (2) | SLOW X 1/6 (FWD) |
| 33h (3) | SLOW X 1/4 (FWD) |
| 34h (4) | SLOW X 1/2 (FWD) |
| 35h (5) | SLOW X 1/8 (RVS) |
| 36h (6) | SLOW X 1/6 (RVS) |
| 37h (7) | SLOW X 1/4 (RVS) |
| 38h (8) | SLOW X 1/2 (RVS) |
| 39h (9) | FF X 64          |
| 3Ah (:) | FF X 32          |
| 3Bh (;) | FF X 16          |
| 3Ch (<) | FF X 8           |
| 3Dh (=) | FF X 6           |
| 3Eh (>) | FF X 4           |
| 3Fh (?) | FF X 2           |
| 40h (@) | FR X 64          |
| 41h (A) | FR X 32          |
| 42h (B) | FR X 16          |
| 43h (C) | FR X 8           |
| 44h (D) | FR X 6           |
| 45h (E) | FR X 4           |
| 46h (F) | FR X 2           |
| 47h (G) | NORMAL           |

#### 2) Special conditions

- This command is valid only when the mode status is Play (E) or Pause (F) .
- To make the search speed what you want , it needs to send some this command.  
Example : Now it's playing . If you make the search speed to FF X 6 , it needs to send this command 3 times.  
The operation matrix is shown as next page.

Operation matrix

| DISC          |     | DVD-VIDEO /DVD-AUDIO /MP3 /DVD-VR/BD |              | CDDA/SACD            |       |              |
|---------------|-----|--------------------------------------|--------------|----------------------|-------|--------------|
| Now Operation |     | Slow /Search command                 |              | Slow /Search command |       |              |
|               |     | ' + '                                | ' - '        | ' + '                | ' - ' |              |
| FF            | 2X  | FF 4X                                | FR 2X        | FF 4X                | FR 2X |              |
|               | 4X  | FF 6X                                |              | FF 6X                |       |              |
|               | 6X  | FF 8X                                |              | FF 8X                |       |              |
|               | 8X  | FF 16X                               |              | FF 2X                |       |              |
|               | 16X | FF 32X                               |              | /                    |       |              |
|               | 32X | FF 64X                               |              |                      |       |              |
|               | 64X | FF 2X                                |              |                      |       |              |
| Playing (1X)  |     | FF 2X                                | FR 2X        | FF 2X                | FR 2X |              |
| FR            | 2X  | FF 2X                                | FR 4X        | FF 2X                | FR 4X |              |
|               | 4X  |                                      | FR 6X        |                      | FR 6X |              |
|               | 6X  |                                      | FR 8X        |                      | FR 8X |              |
|               | 8X  |                                      | FR 16X       |                      | FR 2X |              |
|               | 16X |                                      | FR 32X       |                      | /     |              |
|               | 32X |                                      | FR 64X       |                      |       |              |
|               | 64X |                                      | FR 2X        |                      |       |              |
| DISC          |     | DVD-VIDEO/DVD-VR/BD                  |              | /                    |       |              |
| Pausing       |     | SLOW FWD 1/8                         | SLOW RVS 1/8 |                      |       |              |
| SLOW          | FWD | 1/8                                  | SLOW FWD 1/8 |                      |       | SLOW FWD 1/6 |
|               |     | 1/6                                  |              |                      |       | SLOW FWD 1/4 |
|               |     | 1/4                                  |              |                      |       | SLOW FWD 1/2 |
|               |     | 1/2                                  |              |                      |       | SLOW FWD 1/8 |
|               | RVS | 1/8                                  | SLOW FWD 1/8 |                      |       | SLOW RVS 1/6 |
|               |     | 1/6                                  |              |                      |       | SLOW RVS 1/4 |
|               |     | 1/4                                  |              |                      |       | SLOW RVS 1/2 |
|               |     | 1/2                                  |              |                      |       | SLOW RVS 1/8 |
| Others        |     | ignore                               |              |                      |       |              |

### 1.9.9 Setup

This operation the initial setting .

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' E ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' E ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

#### 2) Special conditions

- This command is valid only when the mode status is Stop (B) .

### 1.9.10 Top Menu

This playback title menu in the DVD disc..

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' F ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' F ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

### 1.9.11 Menu

This plays root menu in the DVD disc.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)              |   |   |   |   |   |   |   |
| 1          | Command code ( ' G ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX (03h)              |   |   |   |   |   |   |   |
| 8          | BCCH (high-level)      |   |   |   |   |   |   |   |
| 9          | BCCL (low-level)       |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' G ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX (03h)            |   |   |   |   |   |   |   |
| 4          | BCCH (high-level)    |   |   |   |   |   |   |   |
| 5          | BCCL (low-level)     |   |   |   |   |   |   |   |

## 1.9.12 Return

This returns previous setup menu screen.

| byte \ bit | 7                     | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|-----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)             |   |   |   |   |   |   |   |
| 1          | Command code ( 'H ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)         |   |   |   |   |   |   |   |
| 3          | Reserve (00h)         |   |   |   |   |   |   |   |
| 4          | Reserve (00h)         |   |   |   |   |   |   |   |
| 5          | Reserve (00h)         |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )       |   |   |   |   |   |   |   |
| 7          | ETX (03h)             |   |   |   |   |   |   |   |
| 8          | BCCH (high-level)     |   |   |   |   |   |   |   |
| 9          | BCCL (low-level)      |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)           |   |   |   |   |   |   |   |
| 1          | Reply code ( 'H ' ) |   |   |   |   |   |   |   |
| 2          | Answer code         |   |   |   |   |   |   |   |
| 3          | ETX (03h)           |   |   |   |   |   |   |   |
| 4          | BCCH (high-level)   |   |   |   |   |   |   |   |
| 5          | BCCL (low-level)    |   |   |   |   |   |   |   |

## 2) Special condition

- This command is valid only when setup menu or display menu is displayed.



### 1.9.13 Audio

This selects dialog in the BD/DVD disc.

| byte \ bit | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|--|---|---|---|---|---|---|---|
| 0          | STX ( 02h )  |   |   |   |   |   |   |   |
| 1          | Command code ( ' I ' )                               |   |   |   |   |   |   |   |
| 2          | Audio skip code ( Forward : ' + ' )                  |   |   |   |   |   |   |   |
| 3          | Audio stream code( ' + ':Primary / ' - ': Secondary) |   |   |   |   |   |   |   |
| 4          | Reserve (00h)  |   |   |   |   |   |   |   |
| 5          | Reserve (00h)  |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )                                      |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )  |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )                                  |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )                                   |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7                                       | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                             |   |   |   |   |   |   |   |
| 1          | Reply code ( ' I ' )                    |   |   |   |   |   |   |   |
| 2          | Answer code                             |   |   |   |   |   |   |   |
| 3          | Current audio stream channel (digit 10) |   |   |   |   |   |   |   |
| 4          | Current audio stream channel (digit 1)  |   |   |   |   |   |   |   |
| 5          | Total audio stream channel (digit 10)   |   |   |   |   |   |   |   |
| 6          | Total audio stream channel (digit 1)    |   |   |   |   |   |   |   |
| 7          | Audio format ( *1 )                     |   |   |   |   |   |   |   |
| 8          | Audio channel ( *2 )                    |   |   |   |   |   |   |   |
| 9          | Dialog ( *3 )                           |   |   |   |   |   |   |   |
| 10         | ETX ( 03h )                             |   |   |   |   |   |   |   |
| 11         | BCCH ( high-level )                     |   |   |   |   |   |   |   |
| 12         | BCCL ( low-level )                      |   |   |   |   |   |   |   |

#### ( \*1) Audio format code

| Code    | Audio Format  |
|---------|---------------|
| 31h (1) | Dolby Digital |
| 32h (2) | DTS           |
| 33h (3) | MPEG          |
| 34h (4) | LPCM          |
| 35h (5) | PPCM          |
| 36h (6) | UNKNOWN       |
| 37h (7) | DSD           |
| 38h (8) | DD+           |
| 39h (9) | DTS-HD        |
| 3Ah (·) | DOLBY TrueHD  |
| 3Bh (·) | MP3           |
| 3Ch (<) | AAC           |
| 3Dh (=) | WMA           |

#### ( \*2) Audio channel code

| Code    | Audio Channel      |
|---------|--------------------|
| 31h (1) | 1 ch               |
| 32h (2) | 2 ch               |
| 33h (3) | 2.1 ch             |
| 34h (4) | 3 ch               |
| 35h (5) | 3.1 ch             |
| 36h (6) | 4 ch               |
| 37h (7) | 4.1 ch             |
| 38h (8) | 5 ch               |
| 39h (9) | 5.1 ch             |
| 3Ah (·) | 6 ch               |
| 3Bh (·) | L/R (CD /VCD /MP3) |
| 3Ch (<) | R (CD /VCD)        |
| 3Dh (=) | L (CD /VCD)        |
| 3Eh (>) | UNKNOWN            |
| 3Fh (?) | 6.1ch              |
| 40h (@) | 7 ch               |
| 41h (A) | 7.1ch              |
| 42h (B) | 8ch                |

#### ( \*3) Dialog code

| Code    | Dialog |
|---------|--------|
| 31h (1) | JPN    |
| 32h (2) | ENG    |
| 33h (3) | FRA    |
| 34h (4) | DEU    |
| 35h (5) | ITA    |
| 36h (6) | ESP    |
| 37h (7) | NLD    |
| 38h (8) | CHI    |
| 39h (9) | RUS    |
| 3Ah (·) | KOR    |
| 3Bh (·) | OTHER  |

### 1.9.14 Subtitle

This selects subtitle language in the BD/ DVD disc.

| byte \ bit | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|--|---|---|---|---|---|---|---|
| 0          | STX ( 02h )  |   |   |   |   |   |   |   |
| 1          | Command code ( ' J ' )   |   |   |   |   |   |   |   |
| 2          | Subtitle skip code ( Forward : ' + ' )   |   |   |   |   |   |   |   |
| 3          | Subtitle stream code<br>(31h(1):Primary / 32h(2):Primary Style / 33h(3):Secondary) |   |   |   |   |   |   |   |
| 4          | Reserve (00h)  |   |   |   |   |   |   |   |
| 5          | Reserve (00h)  |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )  |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )  |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )   |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                 |   |   |   |   |   |   |   |
| 1          | Reply code ( ' J ' )                        |   |   |   |   |   |   |   |
| 2          | Answer code                                 |   |   |   |   |   |   |   |
| 3          | Current subtitle stream channel (digit 100) |   |   |   |   |   |   |   |
| 4          | Current subtitle stream channel (digit 10)  |   |   |   |   |   |   |   |
| 5          | Current subtitle stream channel (digit 1)   |   |   |   |   |   |   |   |
| 6          | Total subtitle stream channel (digit 100)   |   |   |   |   |   |   |   |
| 7          | Total subtitle stream channel (digit 10)    |   |   |   |   |   |   |   |
| 8          | Total subtitle stream channel (digit 1)     |   |   |   |   |   |   |   |
| 9          | Subtitle language ( *1 )                    |   |   |   |   |   |   |   |
| 10         | ETX ( 03h )                                 |   |   |   |   |   |   |   |
| 11         | BCCH ( high-level )                         |   |   |   |   |   |   |   |
| 12         | BCCL ( low-level )                          |   |   |   |   |   |   |   |

#### ( \*1) Subtitle language code

| Code      | Dialog |
|-----------|--------|
| 31h (1)   | JPN    |
| 32h (2)   | ENG    |
| 33h (3)   | FRA    |
| 34h (4)   | DEU    |
| 35h (5)   | ITA    |
| 36h (6)   | ESP    |
| 37h (7)   | NLD    |
| 38h (8)   | CHI    |
| 39h (9)   | RUS    |
| 3Ah ( : ) | KOR    |
| 3Bh ( ; ) | OTHER  |

#### 2) Special condition

- When the value of the "current subtitle stream channel( both digit10 and digit1 )" is zero, it means the subtitle is OFF.

## 1.9.15 Angle

This selects angle in the DVD disc.

| byte \ bit | 7                                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|-------------------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                         |   |   |   |   |   |   |   |
| 1          | Command code ( ' K ' )              |   |   |   |   |   |   |   |
| 2          | Angle skip code ( Forward : ' + ' ) |   |   |   |   |   |   |   |
| 3          | Reserve (00h)                       |   |   |   |   |   |   |   |
| 4          | Reserve (00h)                       |   |   |   |   |   |   |   |
| 5          | Reserve (00h)                       |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )                     |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                         |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )                 |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )                  |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                            | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                  |   |   |   |   |   |   |   |
| 1          | Reply code ( ' K ' )         |   |   |   |   |   |   |   |
| 2          | Answer code                  |   |   |   |   |   |   |   |
| 3          | Current angle stream channel |   |   |   |   |   |   |   |
| 4          | Total angle stream channel   |   |   |   |   |   |   |   |
| 5          | ETX ( 03h )                  |   |   |   |   |   |   |   |
| 6          | BCCH ( high-level )          |   |   |   |   |   |   |   |
| 7          | BCCL ( low-level )           |   |   |   |   |   |   |   |

### 1.9.16 Direct Select

This directly selects specify track in the disc.

| byte \ bit | 7                            | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                  |   |   |   |   |   |   |   |
| 1          | Command code ( ' L ' )       |   |   |   |   |   |   |   |
| 2          | Search mode code ( *1 )      |   |   |   |   |   |   |   |
| 3          | Track number ( 1000 digits ) |   |   |   |   |   |   |   |
| 4          | Track number ( 100 digits )  |   |   |   |   |   |   |   |
| 5          | Track number ( 10 digits )   |   |   |   |   |   |   |   |
| 6          | Track number ( 1 digit )     |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                  |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )          |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )           |   |   |   |   |   |   |   |

( \*1) Search mode code

| Code    | Search Mode                    |
|---------|--------------------------------|
| 31h (1) | Select group or title number   |
| 32h (2) | Select track or chapter number |

#### 1) Answers returned

| byte \ bit | 7   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                                 |   |   |   |   |   |   |   |
| 1          | Reply code ( ' L ' )                        |   |   |   |   |   |   |   |
| 2          | Answer code                                 |   |   |   |   |   |   |   |
| 3          | Group number or title number (100 digit)    |   |   |   |   |   |   |   |
| 4          | Group number or title number (10 digit)     |   |   |   |   |   |   |   |
| 5          | Group number or title number (1 digit)      |   |   |   |   |   |   |   |
| 6          | Chapter number or track number (1000 digit) |   |   |   |   |   |   |   |
| 7          | Chapter number or track number (100 digit)  |   |   |   |   |   |   |   |
| 8          | Chapter number or track number (10 digit)   |   |   |   |   |   |   |   |
| 9          | Chapter number or track number (1 digit)    |   |   |   |   |   |   |   |
| 10         | ETX ( 03h )                                 |   |   |   |   |   |   |   |
| 11         | BCCH ( high-level )                         |   |   |   |   |   |   |   |
| 12         | BCCH ( low-level )                          |   |   |   |   |   |   |   |

## 1.9.17 Cursor

This moves highlight area of initial setting screen.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' M ' ) |   |   |   |   |   |   |   |
| 2          | Cursor code ( *1 )     |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

(\*1) Cursor code

| Code    | Cursor |
|---------|--------|
| 31h (1) | LEFT   |
| 32h (2) | UP     |
| 33h (3) | RIGHT  |
| 34h (4) | DOWN   |

## 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' M ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

## 1.9.18 Enter

This decides selected item in the setup menu etc..

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' N ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)           |   |   |   |   |   |   |   |
| 1          | Reply code ( 'N ' ) |   |   |   |   |   |   |   |
| 2          | Answer code         |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )         |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level ) |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )  |   |   |   |   |   |   |   |

### 1.9.19 SACD Layer Select

This selects the layer of SACD.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' O ' ) |   |   |   |   |   |   |   |
| 2          | Layer code ( *1 )      |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

( \*1) Layer code

| Code    | Layer          |
|---------|----------------|
| 31h (1) | 2ch Layer      |
| 32h (2) | Multi ch Layer |
| 33h (3) | CD Layer       |

#### 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' O ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.9.20 Request CPU Version

This gets CPU version number.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' 1 ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

#### 1) Answers returned

| byte \ bit | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|--|---|---|---|---|---|---|---|
| 0          | STX (02h)                                  |   |   |   |   |   |   |   |
| 1          | Reply code ( ' 1 ' )                       |   |   |   |   |   |   |   |
| 2          | Answer code                                |   |   |   |   |   |   |   |
| 3          | MCU $\mu$ -con version number (1000 digit) |   |   |   |   |   |   |   |
| 4          | MCU $\mu$ -con version number (100 digit)  |   |   |   |   |   |   |   |
| 5          | MCU $\mu$ -con version number (10 digit)   |   |   |   |   |   |   |   |
| 6          | MCU $\mu$ -con version number (1 digit)    |   |   |   |   |   |   |   |
| 7          | B/E $\mu$ -con version number (1000 digit) |   |   |   |   |   |   |   |
| 8          | B/E $\mu$ -con version number (100 digit)  |   |   |   |   |   |   |   |
| 9          | B/E $\mu$ -con version number (10 digit)   |   |   |   |   |   |   |   |
| 10         | B/E $\mu$ -con version number (1 digit)    |   |   |   |   |   |   |   |
| 11         | F/E $\mu$ -con version number (1000 digit) |   |   |   |   |   |   |   |
| 12         | F/E $\mu$ -con version number (100 digit)  |   |   |   |   |   |   |   |
| 13         | F/E $\mu$ -con version number (10 digit)   |   |   |   |   |   |   |   |
| 14         | F/E $\mu$ -con version number (1 digit)    |   |   |   |   |   |   |   |
| 15         | ETX ( 03h )                                |   |   |   |   |   |   |   |
| 16         | BCCH ( high-level )                        |   |   |   |   |   |   |   |
| 17         | BCCH ( low-level )                         |   |   |   |   |   |   |   |

#### 2) Special condition

- This command is valid only when system status is except 'System Initialize (1) '.



### 1.10 Extension Command specification

- These Commands are extended to make it more convenient than Version 1.0.
- It makes control as same buttons of REMOTE CONTROLLER.

#### 1.10.1 OPEN/CLOSE

This command can control Disc Tray.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' a ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' a ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

#### 1.10.2 VIDEO RESOLUTION

This command can change the resolution of HDMI.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' d ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' d ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

## 1.10.3 PROGRAM/DIRECT

This command can change the Play Mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' e ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' e ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

## 1.10.4 CLEAR

This command can erase the programmed tracks.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' f ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' f ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

## 1.10.5 CALL

This command can displayed Programmed tracks on VFD.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' g ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' g ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.6 DISPLAY / INFO

This command can show the information on screen display.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' h ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' h ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.7 REPEAT

This command can change the Repeat Mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' i ' ) |   |   |   |   |   |   |   |
| 2          | Repeat code (*1)       |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

( \*1) Repeat code

| Code    | Repeat Mode |
|---------|-------------|
| 31h (1) | REPEAT      |
| 32h (2) | A-B         |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' i ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.8 PAGE + / DVD A PAGE

This command can change the picture of DVD-Audio.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' j ' ) |   |   |   |   |   |   |   |
| 2          | Page code (*1)         |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' j ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

(\*1) Rage code

| Code    | Page     |
|---------|----------|
| 31h (1) | + (Plus) |

### 1.10.9 RANDOM

This command can change the Play Mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' k ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' k ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.10 DIMMER

This command can change luminance on VFD.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' n ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' n ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.11 PICTURE ADJUST

This command can show the picture adjust mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' o ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' o ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.12 PURE DIRECT

This command can select the mode or show the memory of pure direct.

| Byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' p ' ) |   |   |   |   |   |   |   |
| 2          | Pure Direct code (*1)  |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' p ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

(\*1) Pure Direct code

| Code    | Pure Direct |
|---------|-------------|
| 31h (1) | SELECT      |

### 1.10.13 AUTO TRANSFER MODE

This command sets the answer of [Request System Status] send flag, when the status of Player changed.

An initial value of this flag is Auto.

This flag value is not stored in Flash ROM.

| Byte \ bit | 7                       | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|-------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )             |   |   |   |   |   |   |   |
| 1          | Command code ( ' q ' )  |   |   |   |   |   |   |   |
| 2          | Transfer Mode code (*1) |   |   |   |   |   |   |   |
| 3          | Reserve (00h)           |   |   |   |   |   |   |   |
| 4          | Reserve (00h)           |   |   |   |   |   |   |   |
| 5          | Reserve (00h)           |   |   |   |   |   |   |   |
| 6          | Reserve (00h)           |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )             |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )     |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )      |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' q ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

(\*1) Transfer Mode code

| Code    | Transfer Mode |
|---------|---------------|
| 31h (1) | One Time      |
| 32h (2) | Auto          |

## 1.10.14 FUNCTION / COLOR

I carry out a function peculiar to a disk.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' r ' ) |   |   |   |   |   |   |   |
| 2          | Function code (*2)     |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

## 1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' r ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

## (\*2) Function code

| Code    | Transfer Mode |
|---------|---------------|
| 31h (1) | COLOR( RED )  |
| 32h (2) | COLOR(GREEN)  |
| 33h (3) | COLOR(BULE)   |
| 34h (4) | COLOR(YELLOW) |



1.10.15 Mode / OPTION

I call various functions.

I change an external memory play mode and a disk play mode.(DVD-UD1X Only)

| byte \ bit | 7                          | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                |   |   |   |   |   |   |   |
| 1          | Command code ( ' t ' )     |   |   |   |   |   |   |   |
| 2          | Direct Select Code 1st(*1) |   |   |   |   |   |   |   |
| 3          | Direct Select Code 2nd(*2) |   |   |   |   |   |   |   |
| 4          | Direct Select Code 3rd(*3) |   |   |   |   |   |   |   |
| 5          | Direct Select Code 4th(*4) |   |   |   |   |   |   |   |
| 6          | Reserve (00h)              |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )        |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )         |   |   |   |   |   |   |   |

( \*1)( \*2)( \*3)( \*4) Direct Select code

| No. | Direct Select |      |     |     | Detail                         |
|-----|---------------|------|-----|-----|--------------------------------|
|     | 1st           | 2nd  | 3rd | 4th |                                |
| 1   | 0x00          | N/A  | N/A | N/A | Toggle Mode                    |
| 2   | 0x20          | 0x20 | N/A | N/A | BD Audio Mode:HD Audio Output  |
| 3   | 0x20          | 0x21 | N/A | N/A | BD Audio Mode:Mix Audio Output |
| 4   | 0x35          | 0x20 | N/A | N/A | Picture-in-Picture Select:OFF  |
| 5   | 0x35          | 0x21 | N/A | N/A | Picture-in-Picture Select:1    |
| 6   | 0x35          | 0x22 | N/A | N/A | Picture-in-Picture Select:2    |
| 7   | 0x35          | 0x23 | N/A | N/A | Picture-in-Picture Select:3    |
| 8   | 0x35          | 0x24 | N/A | N/A | Picture-in-Picture Select:4    |
| 9   | 0x35          | 0x25 | N/A | N/A | Picture-in-Picture Select:5    |
| 10  | 0x35          | 0x26 | N/A | N/A | Picture-in-Picture Select:6    |
| 11  | 0x35          | 0x27 | N/A | N/A | Picture-in-Picture Select:7    |
| 12  | 0x35          | 0x28 | N/A | N/A | Picture-in-Picture Select:8    |
| 13  | 0x35          | 0x29 | N/A | N/A | Picture-in-Picture Select:9    |

1) Answers returned

| Byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' t ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

1.10.16 Search Mode / SEARCH

Select title/chapter/time search mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' { ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' { ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.17 Disc Layer Select

Change Disc Layer Mode.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( '   ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( '   ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.18 Aspect ratio

This command can change the Aspect ratio.

| byte \ bit | 7                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )         |   |   |   |   |   |   |   |
| 1          | Command code ('x')  |   |   |   |   |   |   |   |
| 2          | Aspect (*1)         |   |   |   |   |   |   |   |
| 3          | Reserve (00h)       |   |   |   |   |   |   |   |
| 4          | Reserve (00h)       |   |   |   |   |   |   |   |
| 5          | Reserve (00h)       |   |   |   |   |   |   |   |
| 6          | Reserve (00h)       |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )         |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level ) |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )  |   |   |   |   |   |   |   |

( \*1) Aspect code

| Code    | Aspect         |
|---------|----------------|
| 31h (1) | 16 : 9 Squeeze |
| 32h (2) | 16:9 wide      |

1) Answers returned

| byte \ bit | 7                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)           |   |   |   |   |   |   |   |
| 1          | Reply code ( 'x' )  |   |   |   |   |   |   |   |
| 2          | Answer code         |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )         |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level ) |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )  |   |   |   |   |   |   |   |

### 1.10.19 Progressive Mode

This command can change the progressive mode

| byte \ bit | 7                          | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )                |   |   |   |   |   |   |   |
| 1          | Command code ('u')         |   |   |   |   |   |   |   |
| 2          | Progressive Mode code (*1) |   |   |   |   |   |   |   |
| 3          | Reserve (00h)              |   |   |   |   |   |   |   |
| 4          | Reserve (00h)              |   |   |   |   |   |   |   |
| 5          | Reserve (00h)              |   |   |   |   |   |   |   |
| 6          | Reserve (00h)              |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )                |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )        |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )         |   |   |   |   |   |   |   |

( \*1) Progressive Mode code

| Code    | Progressive Mode |
|---------|------------------|
| 31h (1) | AUTO             |
| 32h (2) | VIDEO            |
| 33h (3) | Film             |

#### 1) Answers returned

| byte \ bit | 7                   | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|---------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)           |   |   |   |   |   |   |   |
| 1          | Reply code ( 'u' )  |   |   |   |   |   |   |   |
| 2          | Answer code         |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )         |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level ) |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )  |   |   |   |   |   |   |   |

### 1.10.20 Firmware Update Start(DPMS)

Start firmware update(DPMS).

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' y ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' y ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

### 1.10.21 Request Firmware Update Status(DPMS)

Request firmware update status(DPMS).

When the error occurs while updating, the answer of [Request System Status]command send from BE.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' Y ' ) |   |   |   |   |   |   |   |
| 2          | Reserve (00h)          |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                        | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|--------------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)                |   |   |   |   |   |   |   |
| 1          | Reply code ( ' Y ' )     |   |   |   |   |   |   |   |
| 2          | Answer code              |   |   |   |   |   |   |   |
| 3          | Firmware Update Status*1 |   |   |   |   |   |   |   |
| 4          | ETX ( 03h )              |   |   |   |   |   |   |   |
| 5          | BCCH ( high-level )      |   |   |   |   |   |   |   |
| 6          | BCCH ( low-level )       |   |   |   |   |   |   |   |

( \*1) Firmware Update Status

| Code    | Transfer Mode     |
|---------|-------------------|
| 31h (1) | Now Checking      |
| 32h (2) | Latest Version    |
| 33h (3) | Now Updating      |
| 34h (4) | Cannot Update Now |
| 35h (5) | Server Error      |
| 36h (6) | Connection Error  |
| 37h (7) | Down Load Error   |

### 1.10.22 Home

HOME menu screen.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' P ' ) |   |   |   |   |   |   |   |
| 2          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 3          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 4          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 5          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 6          | Reserve ( 00h )        |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCL ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )          |   |   |   |   |   |   |   |
| 1          | Reply code ( ' P ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCL ( low-level )   |   |   |   |   |   |   |   |

### 1.10.23 Ten Key

0-9 and +10 key input.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' Z ' ) |   |   |   |   |   |   |   |
| 2          | Number code (*2)       |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

1) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' Z ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

( \*2) Number code

| Code    | Transfer Mode |
|---------|---------------|
| 30h (0) | 0             |
| 31h (1) | 1             |
| 32h (2) | 2             |
| 33h (3) | 3             |
| 34h (3) | 4             |
| 35h (3) | 5             |
| 36h (3) | 6             |
| 37h (3) | 7             |
| 38h (3) | 8             |
| 39h (3) | 9             |
| 3Ah (3) | +10           |

### 1.10.24 Network Service

Change function to network services.

| byte \ bit | 7                      | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|------------------------|---|---|---|---|---|---|---|
| 0          | STX ( 02h )            |   |   |   |   |   |   |   |
| 1          | Command code ( ' } ' ) |   |   |   |   |   |   |   |
| 2          | Function code (*2)     |   |   |   |   |   |   |   |
| 3          | Reserve (00h)          |   |   |   |   |   |   |   |
| 4          | Reserve (00h)          |   |   |   |   |   |   |   |
| 5          | Reserve (00h)          |   |   |   |   |   |   |   |
| 6          | Reserve (00h)          |   |   |   |   |   |   |   |
| 7          | ETX ( 03h )            |   |   |   |   |   |   |   |
| 8          | BCCH ( high-level )    |   |   |   |   |   |   |   |
| 9          | BCCH ( low-level )     |   |   |   |   |   |   |   |

#### 2) Answers returned

| byte \ bit | 7                    | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|------------|----------------------|---|---|---|---|---|---|---|
| 0          | STX (02h)            |   |   |   |   |   |   |   |
| 1          | Reply code ( ' } ' ) |   |   |   |   |   |   |   |
| 2          | Answer code          |   |   |   |   |   |   |   |
| 3          | ETX ( 03h )          |   |   |   |   |   |   |   |
| 4          | BCCH ( high-level )  |   |   |   |   |   |   |   |
| 5          | BCCH ( low-level )   |   |   |   |   |   |   |   |

#### ( \*2) Function code

| Code    | Transfer Mode |
|---------|---------------|
| 31h (1) | YouTube       |
| 32h (2) | Netflix       |
| 33h (3) | Vudu          |
| 34h (4) | Hulu△Rev1.10  |
|         |               |