

**Specification
for
Serial Interface DVD-A1UD**

Ver1.06

Revision Table

Rev.	Date	Name	Description
1.00	2007-12-20	Yamashita	I make specifications of DVD-2500BT/3800BD for the cause.
1.01	2008-4-22	Yamashita	I Add Search Mode.
1.02	2008-10-28	Yamashita	I add Source Command. I change Code of Search Mode Command. A name change of HDMI Select and HDMI Format. The deletion of the unnecessary part. I change a model name for an official name.
1.03	2008-10-29	Yamashita	I change Mode Command..
1.04	2009-03-03	Yamashita	I change Mode Command..
1.05	2009-06-02	Yamashita	The deletion of an unnecessary command.
1.06	2009-07-16	Yamashita	I add Disc Layer Select Command.

Contents

1	SERIAL COMMUNICATION INTERFACE.....	5
1.1	PHYSICAL INTERFACE.....	5
1.2	TRANSFER FORMAT OF SERIAL DATA.....	5
1.3	COMMAND FORMAT AND ANSWER FORMAT	6
1.4	PROTOCOL FOR DATA TRANSMISSION AND RECEPTION	6
1.4.1	Basic procedure.....	6
1.4.2	Communication errors.....	7
1.5	COMMAND / ANSWER SEQUENCE.....	8
1.6	LIST OF COMMAND CODES	12
1.7	LIST OF ANSWER CODES.....	13
1.8	LIST OF STATUS CODES	13
1.9	COMMAND SPECIFICATION	14
1.9.1	Power ON	14
1.9.2	Power OFF.....	15
1.9.3	Request System Status.....	16
1.9.4	Play	18
1.9.5	Stop	19
1.9.6	Pause.....	20
1.9.7	Skip	21
1.9.8	Slow /Search	22
1.9.9	Setup.....	24
1.9.10	Top Menu	25
1.9.11	Menu.....	26
1.9.12	Return	27
1.9.13	Audio	28
1.9.14	Subtitle.....	29
1.9.15	Angle	30
1.9.16	Direct Select.....	31

1.9.17	Cursor.....	32
1.9.18	Enter.....	33
1.9.19	SACD Layer Seselect	34
1.9.20	Request CPU Version.....	35
1.9.21	Request Error status.....	36
1.10	EXTENTION COMMAND SPECIFICATION	37
1.10.1	OPEN/CLOSE.....	37
1.10.2	HDMI Mode	37
1.10.3	HDMI Resolution.....	38
1.10.4	PROGRAM/DIRECT.....	38
1.10.5	CLEAR	39
1.10.6	CALL.....	39
1.10.7	DISPLAY.....	40
1.10.8	REPEAT	40
1.10.9	PAGE +.....	41
1.10.10	RANDOM.....	41
1.10.11	MARKER.....	42
1.10.12	ZOOM.....	42
1.10.13	DIMMER	43
1.10.14	PICTURE ADJUST.....	43
1.10.15	PURE DIRECT.....	44
1.10.16	AUTO TRANSFER MODE.....	44
1.10.17	FUNCTION	45
1.10.18	Mode.....	45
1.10.19	Source	51
1.10.20	Search Mode	51
1.10.21	Disc Layer Select.....	52

Serial communication interface

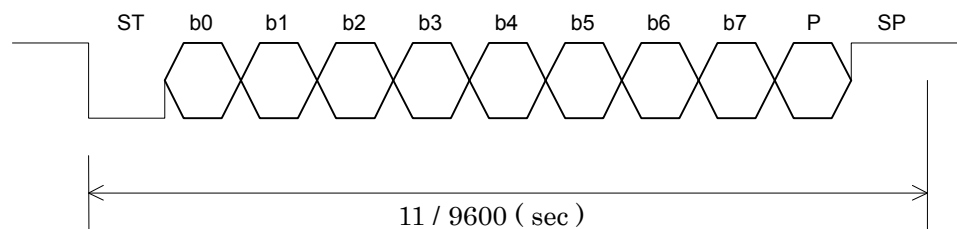
1.1 Physical interface

Arrangement of connector signals

Terminal #	RS-232C	
	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 / None Parity
(default:Even number)
- Stop bit (SP) : 1 bit
- Transfer data : ASCII code
- Control characters : STX (02h)
ETX (03h)
ETB (17h)
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 40μsec.
- 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. ~~60ms~~ 5sec.
- 7) This unit cannot receive any commands for about_5 seconds after the power switch is turned on.

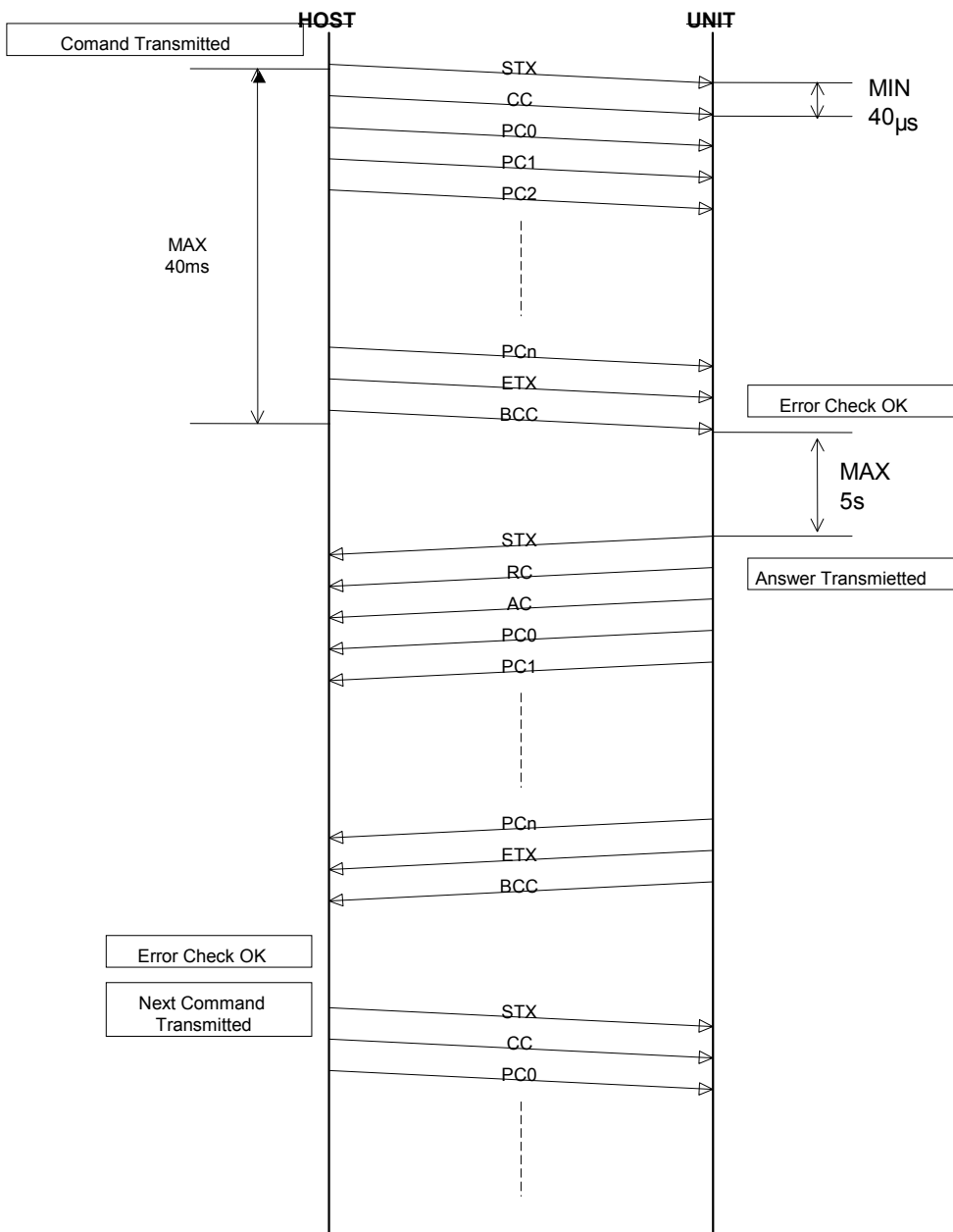
1.4.2 Communication errors

- 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.

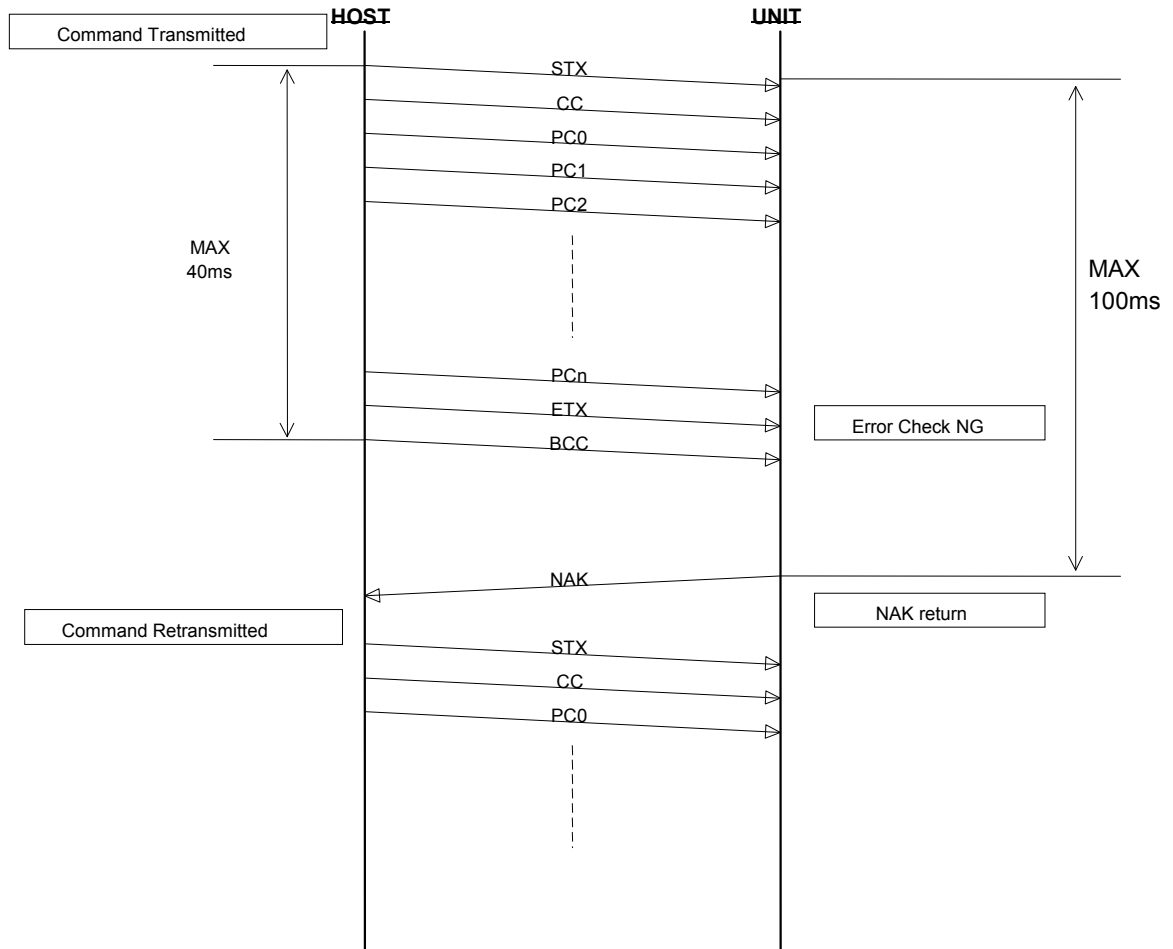
1.5 Command / Answer sequence

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

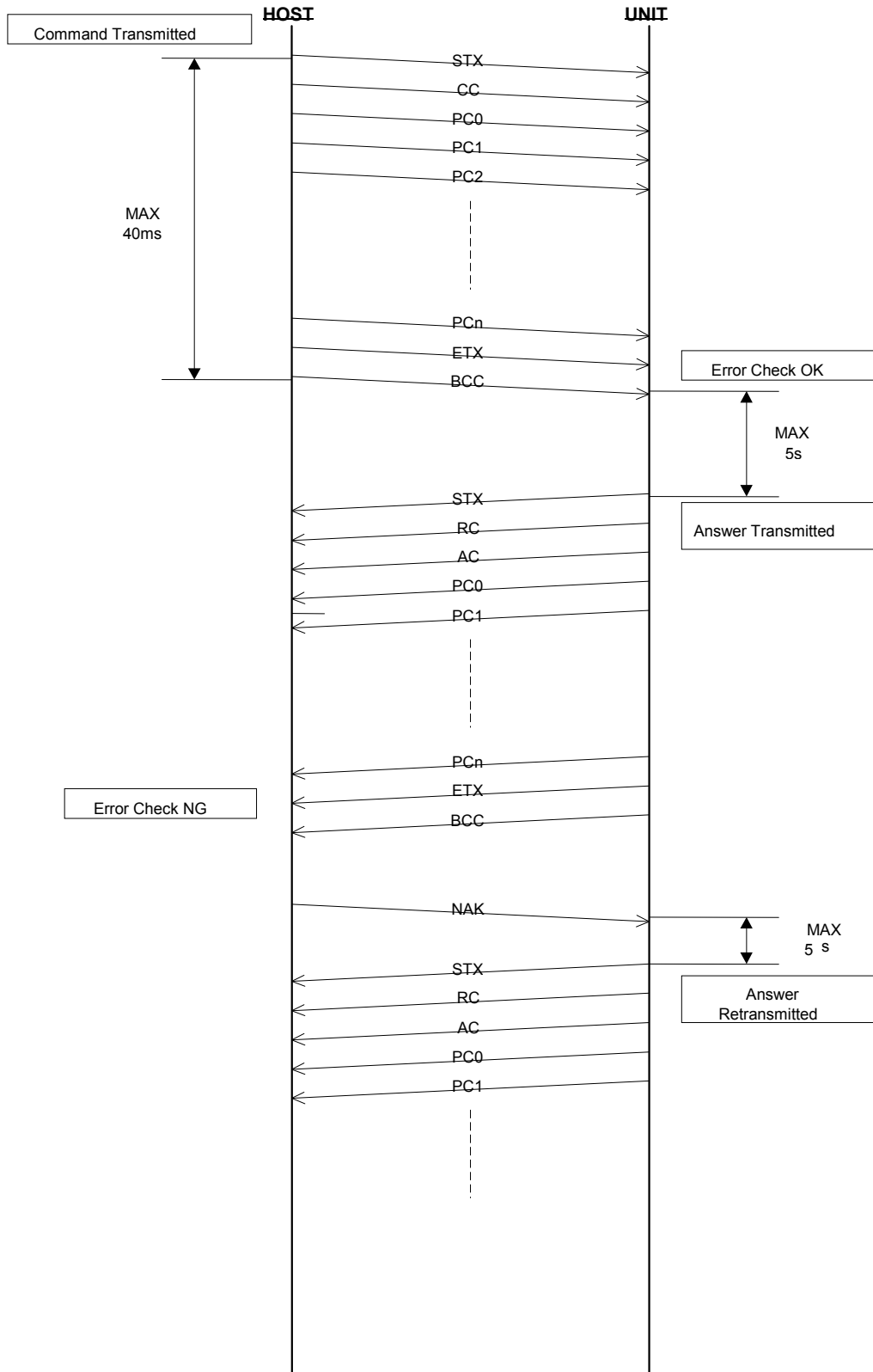
- 1) When a command is normally received (unit) and an answer is normally received (host) with an answer parameter



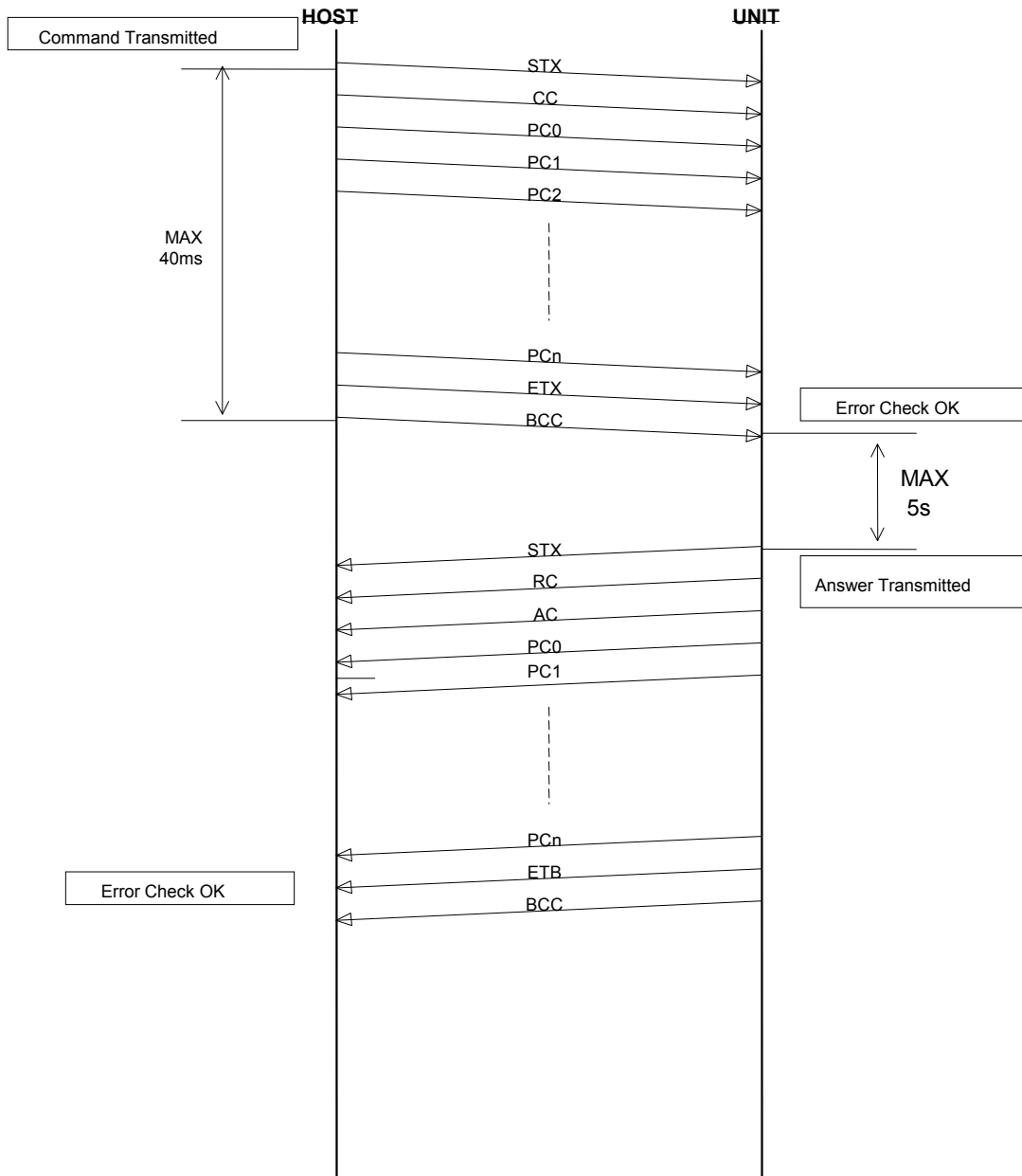
2) When a command is abnormally received (with or without an answer parameter)



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



4) When a command with an answer parameter is normally received (unit) and an answer is normally received with ETB (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 (such as the entire player and transfer unit) .
4	Request CPU Version	31h (1)	Acquires the CPU version.
5	Request Error Status	32h (2)	Acquires the error code when an error is occurred.
6	Request Disc Status	33h (3)	Disk number information is obtained.
7	Play	40h (@)	Starts playback.
8	Stop	41h (A)	Stops playback.
9	Pause	42h (B)	Requests a pause.
10	Skip	43h (C)	Moves to another group or title or chapter or track
11	Slow /Search	44h (D)	Scan
12	Setup	45h (E)	Common procedures of initial setting
13	Top Menu	46h (F)	Playback top menu screen
14	Menu	47h (G)	Playback Menu screen
15	Return	48h (H)	Return
16	Audio	49h (I)	Audio setting
17	Subtitle	4Ah (J)	Subtitle setting
18	Angle	4Bh (K)	Angle setting
19	Direct Select	4Ch (L)	Music search mode
20	Cursor	4Dh (M)	Moves cursor screen
21	Enter	4Eh (N)	Decision
22	SACD Layer Select	4Fh (O)	SACD Layer search mode
23	Disc Select	50h (P)	Disc search mode
24	Disc Skip	51h (Q)	Moves to another Disc
25	OPEN/CLOSE	61h (a)	Disk tray open / closing
26	NTSC/PAL	62h (b)	Change the video output format
27	HDMI Mode	63h (c)	HDMI output mode
28	HDMI Resolution	64h (d)	HDMI output format
29	PROGRAM/DIRECT	65h (e)	Program mode setting
30	CLEAR	66h (f)	Program Entry Track Clear
31	CALL	67h (g)	Program Entry Track Call
32	DISPLAY	68h (h)	Display information screen
33	REPEAT	69h (i)	Repeat mode setting
34	PAGE +/-	6Ah (j)	PAGE setting
35	RANDOM	6Bh (k)	Random mode setting
36	MARKER	6Ch (l)	Marker mode screen
37	ZOOM	6Dh (m)	Zoom setting
38	DIMMER	6Eh (n)	Dimmer setting
39	PICTURE ADJUST	6Fh (o)	Picture menu screen
40	PURE DIRECT	70h (p)	Puredirect menu screen & Puredirect setting
41	AUTO TRANSFER MODE	71h (q)	Status information auto transfer mode setting
42	FUNCTION	72h (r)	I carry out a function peculiar to a disk
43	MAIN/SUB	73h (s)	I perform a change of a main stream / sub stream / main&sub stream(picture-in-picture).
44	Mode	74h (t)	I call various functions.
45	Source	7Ah (z)	Change media play mode
46	Search Mode	7Bh (l)	Select title/chapter/time search mode
47	Disc Layer Select	7Ch (l)	Change Disc Layer Mode.

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.
3	Format Error	31h (1)	Inappropriate command format.
4	Order Track None	32h (2)	The track , the group ,the title or the chapter you specified does not exist.
5	Order Time None	33h (3)	The time you specified does not exist.

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	Disc Loading Complete	32h (2)	Disc Loading complete.
4	Tray Opening	33h (3)	Disc tray open.
5	Tray Closing	34h (4)	Disc tray close.
6	No Disc	41h (A)	Disc not present
7	Stop	42h (B)	Stop
8	Play	43h (C)	Under disc playing.
9	Pause	44h (D)	Playback in process.
10	Scan Play	45h (E)	Scanning in process.
11	Slow Search Play	46h (F)	Slow scanning in process.
12	Setup	47h (G)	Setup mode
13	Play Back Control	48h (H)	Play Back Control scannig in process
14	DVD Resume Stop	49h (I)	Resume stop condition
15	DVD Menu	4Ah (J)	DVD menu playback in process

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 "DENON DVD-A1UD" (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

This status requests the DVD playing information .

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 (;)	Reserved	3Bh (;)	MP3	3Bh (;)	L/R (CD/VCD/MP3)	3Bh (;)	UNKNOWN
3Ch (<)	Reserved	3Ch (<)	AAC	3Ch (<)	R (CD/CD)		
3Dh (=)	Reserved	3Dh (=)	WMA	3Dh (=)	L (CD/VCD)		
3Eh (>)	AVC Rec			3Eh (>)	UNKNOWN		
3Fh (?)	SD			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
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 (;)	UNKNOWN

Code	Angle
31h (1)	1
32h (2)	2
33h (3)	3
34h (4)	4
35h (5)	5
36h (6)	6
37h (7)	7
38h (8)	8
39h (9)	9

Code	Play Mode
31h (1)	NORMAL
32h (2)	PROGRAM
33h (3)	RANDOM

Code	Time Mode
31h (1)	SINGLE ELAPSED
32h (2)	SINGLE REMAIN
33h (3)	TOTAL ELAPSED
34h (4)	TOTAL REMAIN
35h (5)	CHAPTER ELAPSED
36h (6)	CHAPTER REMAIN
37h (7)	TITLE ELAPSED
38h (8)	TITLE REMAIN
39h (9)	TRACK ELAPSED
3Ah (:)	TRACK REMAIN
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)							

~~2) Special conditions~~

- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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)							

~~2) Special conditions~~

- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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) .
- ~~• When status code is 4Bh (DIR mode), this command is not accepted.~~

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 numbsr (100digit)							
4	Group number or title numbsr (10digit)							
5	Group number or title numbsr (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 plaing . 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.
~~• When status code is 4Bh (DIR mode) , this command is not accepted.~~

Operation matrix

DISC		DVD-VIDEO /DVD-AUDIO /MP3 /VideoCD/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		VideoCD		
Pausing		SLOW FWD 1/8	SLOW RVS 1/8	SLOW FWD1/6	ignore	
SLOW	FWD	1/8	SLOW RVS 1/8	ignore		
		1/6		SLOW FWD1/4		
		1/4		SLOW FWD1/2		
		1/2		SLOW FWD1/6		
	RVS	1/8	SLOW FWD 1/8	SLOW RVS 1/6		ignore
		1/6		SLOW RVS 1/4		
		1/4		SLOW RVS 1/2		
	1/2		SLOW RVS 1/8			
Others		ignore		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) .
- ~~When status code is 4Bh (DIR mode) , this command is not accepted.~~

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)							

2) Special condition

- This command is valid only when disc type code is DVD-Video (1) or DVD-Audio (2) .
- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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)							

2) Special condition

- This command is valid only when disc type code is DVD-Video (1) .
- ~~• When status code is 4Bh (DIR mode), this command is not accepted.~~

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.
- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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 (' ')							
2	Audio skip code (Forward : ' + ' / Reverse : ' - ')							
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 (' ')							
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	Dialogl
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 (;)	UNKNOWN

~~2) Special conditions~~

~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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 : ' + ' / Reverse : ' - ')							
3	Subtitle stream code (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	Dialogl
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 (;)	UNKNOWN

2) Special condition

- ~~• When status code is 4Bh (DIR mode), this command is not accepted.~~
- 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 : ' + ' / 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 (' 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)							

2) Special conditions

- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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)							

~~2) Special conditions~~

~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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)							

~~2) Special conditions~~

- ~~• When status code is 4Bh (DIR mode), this command is not accepted.~~

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)							

~~2) Special conditions~~

- ~~When status code is 4Bh (DIR mode), this command is not accepted.~~

1.9.19 SACD Layer Selsct

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)							

~~2) Special conditions~~

~~When status code is 4Bh (DIR mode), this command is not accepted.~~

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	System μ -con version number (1000 digit)							
4	System μ -con version number (100 digit)							
5	System μ -con version number (10 digit)							
6	System μ -con version number (1 digit)							
7	Drive μ -con version number (1000 digit)							
8	Drive μ -con version number (100 digit)							
9	Drive μ -con version number (10 digit)							
10	Drive μ -con version number (1 digit)							
11	Panel μ -con version number (1000 digit)							
12	Panel μ -con version number (100 digit)							
13	Panel μ -con version number (10 digit)							
14	Panel μ -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)'.

1.9.21 Request Error status

This gets error status. If error occurs, it becomes stop mode.

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

2) Special condition

- If error does not occur, set ' 0 ' to byte3 and byte4.

3) Special condition

- Error code is the following.
- After error occurs, it receives only 'OPEN/CLOSE KEY'.

Error code

No.	Error code		Detail
	1 st	2 nd	
1	0x20	0x00	Loading error
2	0x21	0x00	Loading switch error
3	0x22	0x00	Forcus servo error
4	0x23	0x00	Tracking servo error
5	0x24	0x00	Can 't adjust offset value for servo circuit
6	0x25	0x00	Can 't adjust gain value for servo circuit
7	0x26	0x00	Focusing failed in playing or searching or pauseing
8	0x27	0x00	During spinup, data of disc does not read
9	0x28	0x00	During play, data of disc does not read
10	0x29	0x00	Cannot read within a preset time period in TOC reading.
11	0x2A	0x00	Subcode data does not read
12	0x2C	0x00	Command error occurs
13	0x2D	0x00	Focusing failed in scanning

1.10 Extention 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 HDMI Mode

This command can change the YCbCr format or RGB format of HDMI.

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

1.10.3 HDMI Resolution

This command can change the resolution of HDMI/DVI.

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)							

1.10.4 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)							

1.10.5 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)							

1.10.6 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)							

1.10.7 DISPLAY

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)							

1.10.8 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)							

1.10.9 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) Page code

Code	Page
31h (1)	+ (Plus)

1.10.10 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)							

1.10.11 MARKER

This command can show the Marker information on screen display.

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	ETX (03h)							
4	BCCH (high-level)							
5	BCCH (low-level)							

1.10.12 ZOOM

This command can expand the picture.

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

1.10.13 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)							

1.10.14 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)							

1.10.15 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

1.10.16 AUTO TRANSFER MODE

This command can select the Status Transfer Mode.

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

1.10.17 FUNCTION

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)	RED
32h (2)	GREEN
33h (3)	BULE
34h (4)	YELLOW

1.10.18 Mode

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	0x21	N/A	N/A	N/A	Surround Mode:Direct
5	0x22	N/A	N/A	N/A	Surround Mode:PLIIx & Parameter:Cinema
6	0x23	N/A	N/A	N/A	Surround Mode:PLIIx & Parameter:Music
7	0x24	0x20	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 0
8	0x24	0x21	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 1
9	0x24	0x22	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 2
10	0x24	0x23	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 3
11	0x24	0x24	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 4
12	0x24	0x25	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 5
13	0x24	0x26	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Dimension 6

14	0x25	0x20	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 0
15	0x25	0x21	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 1
16	0x25	0x22	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 2
17	0x25	0x23	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 3
18	0x25	0x24	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 4
19	0x25	0x25	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 5
20	0x25	0x26	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 6
21	0x25	0x27	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Center Width 7
22	0x26	0x20	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Panorama Off
23	0x26	0x21	N/A	N/A	Surround Mode:PLIIx & Parameter:Music Panorama On
24	0x27	N/A	N/A	N/A	Surround Mode:PLIIx & Parameter:Game
25	0x28	N/A	N/A	N/A	Surround Mode:PLII & Parameter:Cinema
26	0x29	N/A	N/A	N/A	Surround Mode:PLII & Parameter:Music
27	0x2A	0x20	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 0
28	0x2A	0x21	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 1
29	0x2A	0x22	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 2
30	0x2A	0x23	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 3
31	0x2A	0x24	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 4
32	0x2A	0x25	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 5
33	0x2A	0x26	N/A	N/A	Surround Mode:PLII & Parameter:Music Dimension 6
34	0x2B	0x20	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 0
35	0x2B	0x21	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 1
36	0x2B	0x22	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 2
37	0x2B	0x23	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 3
38	0x2B	0x24	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 4
39	0x2B	0x25	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 5
40	0x2B	0x26	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 6
41	0x2B	0x27	N/A	N/A	Surround Mode:PLII & Parameter:Music Center Width 7
42	0x2C	0x20	N/A	N/A	Surround Mode:PLII & Parameter:Music Panorama Off
43	0x2C	0x21	N/A	N/A	Surround Mode:PLII & Parameter:Music Panorama On
44	0x2D	N/A	N/A	N/A	Surround Mode:PLII & Parameter:Game
45	0x2E	N/A	N/A	N/A	Surround Mode:PLII & Parameter:Pro Logic
46	0x2F	N/A	N/A	N/A	Surround Mode: Neo:6 & Parameter:Cinema
47	0x30	0x20	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.0
48	0x30	0x21	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.1
49	0x30	0x22	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.2
50	0x30	0x23	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.3
51	0x30	0x24	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.4
52	0x30	0x25	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.5
53	0x30	0x26	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.6
54	0x30	0x27	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.7
55	0x30	0x28	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.8
56	0x30	0x29	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 0.9
57	0x30	0x2A	N/A	N/A	Surround Mode: Neo:6 & Parameter:Music Center Image 1.0
58	0x31	0x20	N/A	N/A	Restorer :Off
59	0x31	0x21	N/A	N/A	Restorer :Mode1
60	0x31	0x22	N/A	N/A	Restorer :Mode2
61	0x31	0x23	N/A	N/A	Restorer :Mode3
62	0x32	0x20	N/A	N/A	Audio / Video Sync:HDMI
63	0x32	0x21	N/A	N/A	Audio / Video Sync:Analog Video Out
64	0x33	0x30	0x30	0x30	Audio Delay Adjust: 0ms
65	0x33	0x30	0x30	0x31	Audio Delay Adjust: 1ms
66	0x33	0x30	0x30	0x32	Audio Delay Adjust: 2ms
67	0x33	0x30	0x30	0x33	Audio Delay Adjust: 3ms
68	0x33	0x30	0x30	0x34	Audio Delay Adjust: 4ms
69	0x33	0x30	0x30	0x35	Audio Delay Adjust: 5ms
70	0x33	0x30	0x30	0x36	Audio Delay Adjust: 6ms
71	0x33	0x30	0x30	0x37	Audio Delay Adjust: 7ms
72	0x33	0x30	0x30	0x38	Audio Delay Adjust: 8ms
73	0x33	0x30	0x30	0x39	Audio Delay Adjust: 9ms
74	0x33	0x30	0x31	0x30	Audio Delay Adjust: 10ms
75	0x33	0x30	0x31	0x31	Audio Delay Adjust: 11ms
76	0x33	0x30	0x31	0x32	Audio Delay Adjust: 12ms
77	0x33	0x30	0x31	0x33	Audio Delay Adjust: 13ms
78	0x33	0x30	0x31	0x34	Audio Delay Adjust: 14ms
79	0x33	0x30	0x31	0x35	Audio Delay Adjust: 15ms
80	0x33	0x30	0x31	0x36	Audio Delay Adjust: 16ms
81	0x33	0x30	0x31	0x37	Audio Delay Adjust: 17ms

82	0x33	0x30	0x31	0x38	Audio Delay Adjust: 18ms
83	0x33	0x30	0x31	0x39	Audio Delay Adjust: 19ms
84	0x33	0x30	0x32	0x30	Audio Delay Adjust: 20ms
85	0x33	0x30	0x32	0x31	Audio Delay Adjust: 21ms
86	0x33	0x30	0x32	0x32	Audio Delay Adjust: 22ms
87	0x33	0x30	0x32	0x33	Audio Delay Adjust: 23ms
88	0x33	0x30	0x32	0x34	Audio Delay Adjust: 24ms
89	0x33	0x30	0x32	0x35	Audio Delay Adjust: 25ms
90	0x33	0x30	0x32	0x36	Audio Delay Adjust: 26ms
91	0x33	0x30	0x32	0x37	Audio Delay Adjust: 27ms
92	0x33	0x30	0x32	0x38	Audio Delay Adjust: 28ms
93	0x33	0x30	0x32	0x39	Audio Delay Adjust: 29ms
94	0x33	0x30	0x33	0x30	Audio Delay Adjust: 30ms
95	0x33	0x30	0x33	0x31	Audio Delay Adjust: 31ms
96	0x33	0x30	0x33	0x32	Audio Delay Adjust: 32ms
97	0x33	0x30	0x33	0x33	Audio Delay Adjust: 33ms
98	0x33	0x30	0x33	0x34	Audio Delay Adjust: 34ms
99	0x33	0x30	0x33	0x35	Audio Delay Adjust: 35ms
100	0x33	0x30	0x33	0x36	Audio Delay Adjust: 36ms
101	0x33	0x30	0x33	0x37	Audio Delay Adjust: 37ms
102	0x33	0x30	0x33	0x38	Audio Delay Adjust: 38ms
103	0x33	0x30	0x33	0x39	Audio Delay Adjust: 39ms
104	0x33	0x30	0x34	0x30	Audio Delay Adjust: 40ms
105	0x33	0x30	0x34	0x31	Audio Delay Adjust: 41ms
106	0x33	0x30	0x34	0x32	Audio Delay Adjust: 42ms
107	0x33	0x30	0x34	0x33	Audio Delay Adjust: 43ms
108	0x33	0x30	0x34	0x34	Audio Delay Adjust: 44ms
109	0x33	0x30	0x34	0x35	Audio Delay Adjust: 45ms
110	0x33	0x30	0x34	0x36	Audio Delay Adjust: 46ms
111	0x33	0x30	0x34	0x37	Audio Delay Adjust: 47ms
112	0x33	0x30	0x34	0x38	Audio Delay Adjust: 48ms
113	0x33	0x30	0x34	0x39	Audio Delay Adjust: 49ms
114	0x33	0x30	0x35	0x30	Audio Delay Adjust: 50ms
115	0x33	0x30	0x35	0x31	Audio Delay Adjust: 51ms
116	0x33	0x30	0x35	0x32	Audio Delay Adjust: 52ms
117	0x33	0x30	0x35	0x33	Audio Delay Adjust: 53ms
118	0x33	0x30	0x35	0x34	Audio Delay Adjust: 54ms
119	0x33	0x30	0x35	0x35	Audio Delay Adjust: 55ms
120	0x33	0x30	0x35	0x36	Audio Delay Adjust: 56ms
121	0x33	0x30	0x35	0x37	Audio Delay Adjust: 57ms
122	0x33	0x30	0x35	0x38	Audio Delay Adjust: 58ms
123	0x33	0x30	0x35	0x39	Audio Delay Adjust: 59ms
124	0x33	0x30	0x36	0x30	Audio Delay Adjust: 60ms
125	0x33	0x30	0x36	0x31	Audio Delay Adjust: 61ms
126	0x33	0x30	0x36	0x32	Audio Delay Adjust: 62ms
127	0x33	0x30	0x36	0x33	Audio Delay Adjust: 63ms
128	0x33	0x30	0x36	0x34	Audio Delay Adjust: 64ms
129	0x33	0x30	0x36	0x35	Audio Delay Adjust: 65ms
130	0x33	0x30	0x36	0x36	Audio Delay Adjust: 66ms
131	0x33	0x30	0x36	0x37	Audio Delay Adjust: 67ms
132	0x33	0x30	0x36	0x38	Audio Delay Adjust: 68ms
133	0x33	0x30	0x36	0x39	Audio Delay Adjust: 69ms
134	0x33	0x30	0x37	0x30	Audio Delay Adjust: 70ms
135	0x33	0x30	0x37	0x31	Audio Delay Adjust: 71ms
136	0x33	0x30	0x37	0x32	Audio Delay Adjust: 72ms
137	0x33	0x30	0x37	0x33	Audio Delay Adjust: 73ms
138	0x33	0x30	0x37	0x34	Audio Delay Adjust: 74ms
139	0x33	0x30	0x37	0x35	Audio Delay Adjust: 75ms
140	0x33	0x30	0x37	0x36	Audio Delay Adjust: 76ms
141	0x33	0x30	0x37	0x37	Audio Delay Adjust: 77ms
142	0x33	0x30	0x37	0x38	Audio Delay Adjust: 78ms
143	0x33	0x30	0x37	0x39	Audio Delay Adjust: 79ms
144	0x33	0x30	0x38	0x30	Audio Delay Adjust: 80ms
145	0x33	0x30	0x38	0x31	Audio Delay Adjust: 81ms
146	0x33	0x30	0x38	0x32	Audio Delay Adjust: 82ms
147	0x33	0x30	0x38	0x33	Audio Delay Adjust: 83ms
148	0x33	0x30	0x38	0x34	Audio Delay Adjust: 84ms
149	0x33	0x30	0x38	0x35	Audio Delay Adjust: 85ms

150	0x33	0x30	0x38	0x36	Audio Delay Adjust: 86ms
151	0x33	0x30	0x38	0x37	Audio Delay Adjust: 87ms
152	0x33	0x30	0x38	0x38	Audio Delay Adjust: 88ms
153	0x33	0x30	0x38	0x39	Audio Delay Adjust: 89ms
154	0x33	0x30	0x39	0x30	Audio Delay Adjust: 90ms
155	0x33	0x30	0x39	0x31	Audio Delay Adjust: 91ms
156	0x33	0x30	0x39	0x32	Audio Delay Adjust: 92ms
157	0x33	0x30	0x39	0x33	Audio Delay Adjust: 93ms
158	0x33	0x30	0x39	0x34	Audio Delay Adjust: 94ms
159	0x33	0x30	0x39	0x35	Audio Delay Adjust: 95ms
160	0x33	0x30	0x39	0x36	Audio Delay Adjust: 96ms
161	0x33	0x30	0x39	0x37	Audio Delay Adjust: 97ms
162	0x33	0x30	0x39	0x38	Audio Delay Adjust: 98ms
163	0x33	0x30	0x39	0x39	Audio Delay Adjust: 99ms
164	0x33	0x31	0x30	0x30	Audio Delay Adjust: 100ms
165	0x33	0x31	0x30	0x31	Audio Delay Adjust: 101ms
166	0x33	0x31	0x30	0x32	Audio Delay Adjust: 102ms
167	0x33	0x31	0x30	0x33	Audio Delay Adjust: 103ms
168	0x33	0x31	0x30	0x34	Audio Delay Adjust: 104ms
169	0x33	0x31	0x30	0x35	Audio Delay Adjust: 105ms
170	0x33	0x31	0x30	0x36	Audio Delay Adjust: 106ms
171	0x33	0x31	0x30	0x37	Audio Delay Adjust: 107ms
172	0x33	0x31	0x30	0x38	Audio Delay Adjust: 108ms
173	0x33	0x31	0x30	0x39	Audio Delay Adjust: 109ms
174	0x33	0x31	0x31	0x30	Audio Delay Adjust: 110ms
175	0x33	0x31	0x31	0x31	Audio Delay Adjust: 111ms
176	0x33	0x31	0x31	0x32	Audio Delay Adjust: 112ms
177	0x33	0x31	0x31	0x33	Audio Delay Adjust: 113ms
178	0x33	0x31	0x31	0x34	Audio Delay Adjust: 114ms
179	0x33	0x31	0x31	0x35	Audio Delay Adjust: 115ms
180	0x33	0x31	0x31	0x36	Audio Delay Adjust: 116ms
181	0x33	0x31	0x31	0x37	Audio Delay Adjust: 117ms
182	0x33	0x31	0x31	0x38	Audio Delay Adjust: 118ms
183	0x33	0x31	0x31	0x39	Audio Delay Adjust: 119ms
184	0x33	0x31	0x32	0x30	Audio Delay Adjust: 120ms
185	0x33	0x31	0x32	0x31	Audio Delay Adjust: 121ms
186	0x33	0x31	0x32	0x32	Audio Delay Adjust: 122ms
187	0x33	0x31	0x32	0x33	Audio Delay Adjust: 123ms
188	0x33	0x31	0x32	0x34	Audio Delay Adjust: 124ms
189	0x33	0x31	0x32	0x35	Audio Delay Adjust: 125ms
190	0x33	0x31	0x32	0x36	Audio Delay Adjust: 126ms
191	0x33	0x31	0x32	0x37	Audio Delay Adjust: 127ms
192	0x33	0x31	0x32	0x38	Audio Delay Adjust: 128ms
193	0x33	0x31	0x32	0x39	Audio Delay Adjust: 129ms
194	0x33	0x31	0x33	0x30	Audio Delay Adjust: 130ms
195	0x33	0x31	0x33	0x31	Audio Delay Adjust: 131ms
196	0x33	0x31	0x33	0x32	Audio Delay Adjust: 132ms
197	0x33	0x31	0x33	0x33	Audio Delay Adjust: 133ms
198	0x33	0x31	0x33	0x34	Audio Delay Adjust: 134ms
199	0x33	0x31	0x33	0x35	Audio Delay Adjust: 135ms
200	0x33	0x31	0x33	0x36	Audio Delay Adjust: 136ms
201	0x33	0x31	0x33	0x37	Audio Delay Adjust: 137ms
202	0x33	0x31	0x33	0x38	Audio Delay Adjust: 138ms
203	0x33	0x31	0x33	0x39	Audio Delay Adjust: 139ms
204	0x33	0x31	0x34	0x30	Audio Delay Adjust: 140ms
205	0x33	0x31	0x34	0x31	Audio Delay Adjust: 141ms
206	0x33	0x31	0x34	0x32	Audio Delay Adjust: 142ms
207	0x33	0x31	0x34	0x33	Audio Delay Adjust: 143ms
208	0x33	0x31	0x34	0x34	Audio Delay Adjust: 144ms
209	0x33	0x31	0x34	0x35	Audio Delay Adjust: 145ms
210	0x33	0x31	0x34	0x36	Audio Delay Adjust: 146ms
211	0x33	0x31	0x34	0x37	Audio Delay Adjust: 147ms
212	0x33	0x31	0x34	0x38	Audio Delay Adjust: 148ms
213	0x33	0x31	0x34	0x39	Audio Delay Adjust: 149ms
214	0x33	0x31	0x35	0x30	Audio Delay Adjust: 150ms
215	0x33	0x31	0x35	0x31	Audio Delay Adjust: 151ms
216	0x33	0x31	0x35	0x32	Audio Delay Adjust: 152ms
217	0x33	0x31	0x35	0x33	Audio Delay Adjust: 153ms

218	0x33	0x31	0x35	0x34	Audio Delay Adjust: 154ms
219	0x33	0x31	0x35	0x35	Audio Delay Adjust: 155ms
220	0x33	0x31	0x35	0x36	Audio Delay Adjust: 156ms
221	0x33	0x31	0x35	0x37	Audio Delay Adjust: 157ms
222	0x33	0x31	0x35	0x38	Audio Delay Adjust: 158ms
223	0x33	0x31	0x35	0x39	Audio Delay Adjust: 159ms
224	0x33	0x31	0x36	0x30	Audio Delay Adjust: 160ms
225	0x33	0x31	0x36	0x31	Audio Delay Adjust: 161ms
226	0x33	0x31	0x36	0x32	Audio Delay Adjust: 162ms
227	0x33	0x31	0x36	0x33	Audio Delay Adjust: 163ms
228	0x33	0x31	0x36	0x34	Audio Delay Adjust: 164ms
229	0x33	0x31	0x36	0x35	Audio Delay Adjust: 165ms
230	0x33	0x31	0x36	0x36	Audio Delay Adjust: 166ms
231	0x33	0x31	0x36	0x37	Audio Delay Adjust: 167ms
232	0x33	0x31	0x36	0x38	Audio Delay Adjust: 168ms
233	0x33	0x31	0x36	0x39	Audio Delay Adjust: 169ms
234	0x33	0x31	0x37	0x30	Audio Delay Adjust: 170ms
235	0x33	0x31	0x37	0x31	Audio Delay Adjust: 171ms
236	0x33	0x31	0x37	0x32	Audio Delay Adjust: 172ms
237	0x33	0x31	0x37	0x33	Audio Delay Adjust: 173ms
238	0x33	0x31	0x37	0x34	Audio Delay Adjust: 174ms
239	0x33	0x31	0x37	0x35	Audio Delay Adjust: 175ms
240	0x33	0x31	0x37	0x36	Audio Delay Adjust: 176ms
241	0x33	0x31	0x37	0x37	Audio Delay Adjust: 177ms
242	0x33	0x31	0x37	0x38	Audio Delay Adjust: 178ms
243	0x33	0x31	0x37	0x39	Audio Delay Adjust: 179ms
244	0x33	0x31	0x38	0x30	Audio Delay Adjust: 180ms
245	0x33	0x31	0x38	0x31	Audio Delay Adjust: 181ms
246	0x33	0x31	0x38	0x32	Audio Delay Adjust: 182ms
247	0x33	0x31	0x38	0x33	Audio Delay Adjust: 183ms
248	0x33	0x31	0x38	0x34	Audio Delay Adjust: 184ms
249	0x33	0x31	0x38	0x35	Audio Delay Adjust: 185ms
250	0x33	0x31	0x38	0x36	Audio Delay Adjust: 186ms
251	0x33	0x31	0x38	0x37	Audio Delay Adjust: 187ms
252	0x33	0x31	0x38	0x38	Audio Delay Adjust: 188ms
253	0x33	0x31	0x38	0x39	Audio Delay Adjust: 189ms
254	0x33	0x31	0x39	0x30	Audio Delay Adjust: 190ms
255	0x33	0x31	0x39	0x31	Audio Delay Adjust: 191ms
256	0x33	0x31	0x39	0x32	Audio Delay Adjust: 192ms
257	0x33	0x31	0x39	0x33	Audio Delay Adjust: 193ms
258	0x33	0x31	0x39	0x34	Audio Delay Adjust: 194ms
259	0x33	0x31	0x39	0x35	Audio Delay Adjust: 195ms
260	0x33	0x31	0x39	0x36	Audio Delay Adjust: 196ms
261	0x33	0x31	0x39	0x37	Audio Delay Adjust: 197ms
262	0x33	0x31	0x39	0x38	Audio Delay Adjust: 198ms
263	0x33	0x31	0x39	0x39	Audio Delay Adjust: 199ms
264	0x33	0x32	0x30	0x30	Audio Delay Adjust: 200ms
265	0x34	0x20	N/A	N/A	Vertical Stretch Off
266	0x34	0x21	N/A	N/A	Vertical Stretch On
267	0x35	0x20	N/A	N/A	Picture-in-Picture Select:OFF
268	0x35	0x21	N/A	N/A	Picture-in-Picture Select:1
269	0x35	0x22	N/A	N/A	Picture-in-Picture Select:2
270	0x35	0x23	N/A	N/A	Picture-in-Picture Select:3
271	0x35	0x24	N/A	N/A	Picture-in-Picture Select:4
272	0x35	0x25	N/A	N/A	Picture-in-Picture Select:5
273	0x35	0x26	N/A	N/A	Picture-in-Picture Select:6
274	0x35	0x27	N/A	N/A	Picture-in-Picture Select:7
275	0x35	0x28	N/A	N/A	Picture-in-Picture Select:8
276	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)							

1.10.19 Source

Change media play mode.

byte \ bit	7	6	5	4	3	2	1	0
0	STX (02h)							
1	Command code (' z ')							
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)							

2) 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)							

1.10.20 Search Mode

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)							

3) 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)							

1.10.21 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)							

4) 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)							