

Serial Interface Specification of DBT3313UD

Ver1.0

Approval	Review	Creation

Revision Table

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1 Serial communication interface

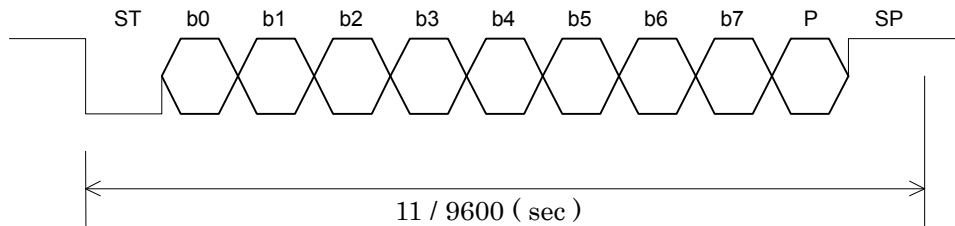
1.1 Physical interface

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) :

$CC + PC0 + PC1 + PC2 + \dots + PCn + ETX = XYh$
 (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) :

$RC + AC + PC0 + PC1 + PC2 + \dots + PCn + ETX = XYh$
 (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 μ 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.

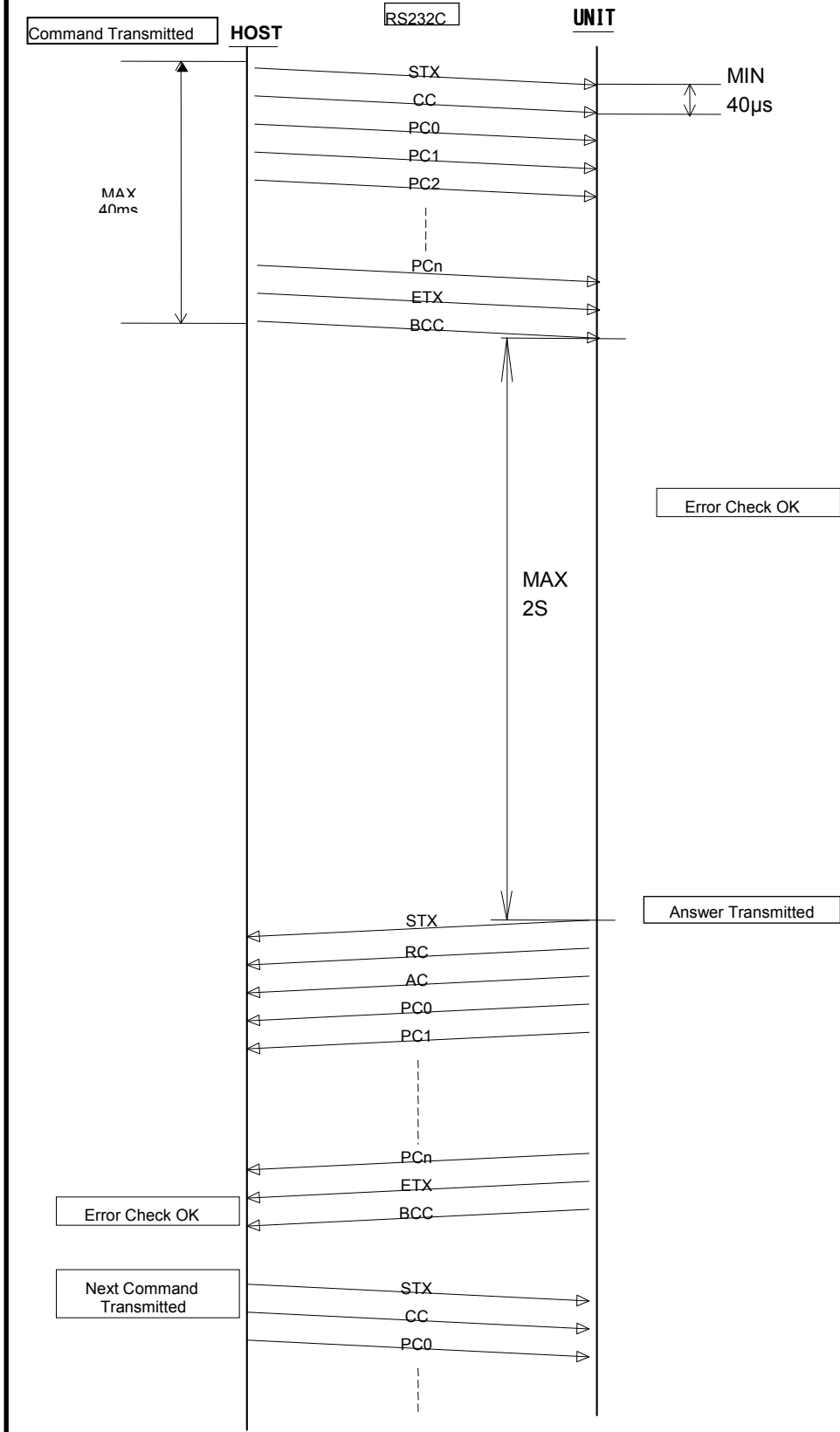
1.4.2 Communication errors

- 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.

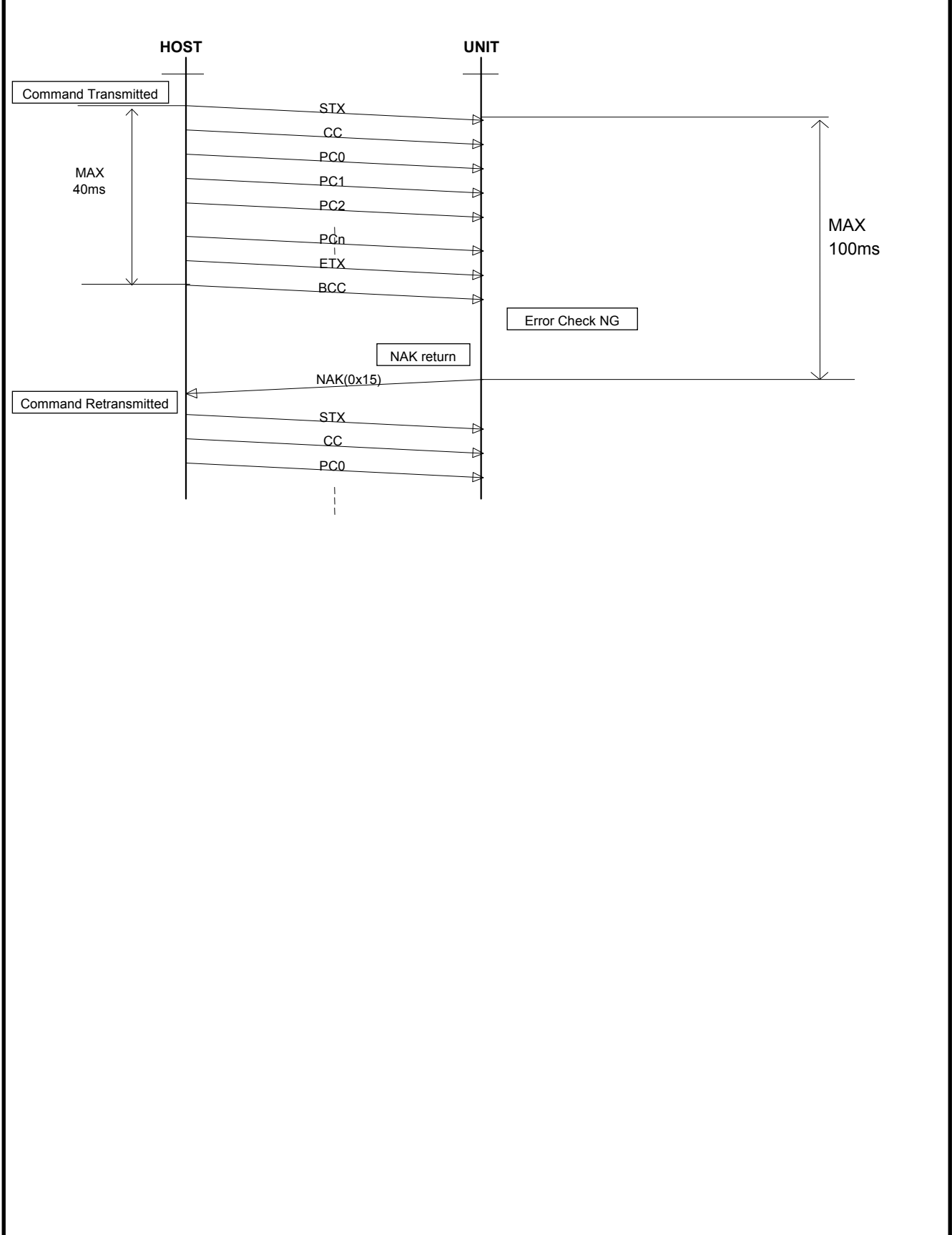
1.5 Command / Answer sequence

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

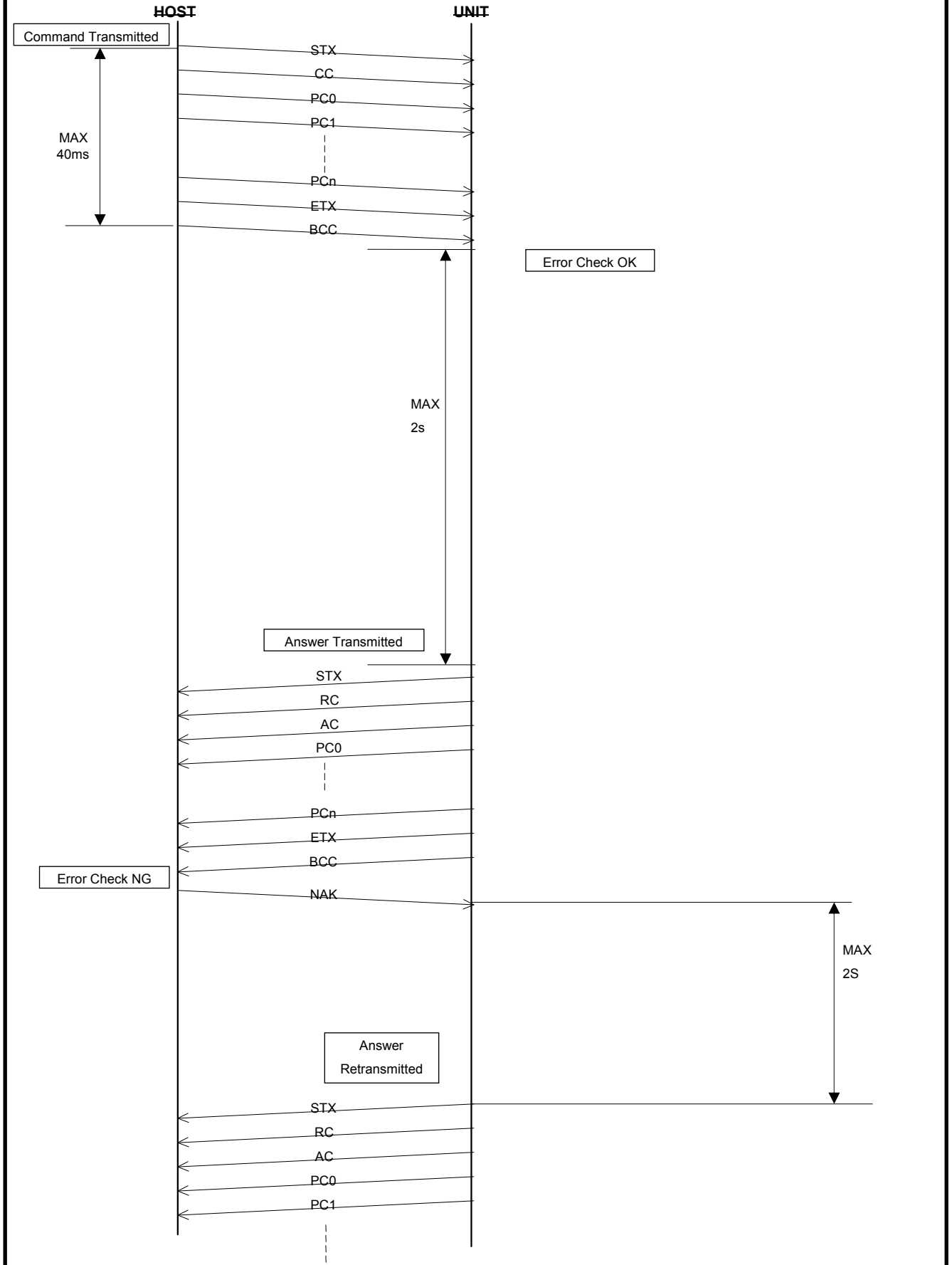
- 1) When a command is normally received (UNIT) and an answer is normally received (host) with an answer parameter



- 2) When a command is abnormally received (with or without an answer parameter)
 - ex) An uncertain command code was received.
 - 1st data is not STX(0x02).
 - 10th 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 (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 “ 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 1/6			
		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 (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 μ -con version number (1000 digit)							
4	MCU μ -con version number (100 digit)							
5	MCU μ -con version number (10 digit)							
6	MCU μ -con version number (1 digit)							
7	B/E μ -con version number (1000 digit)							
8	B/E μ -con version number (100 digit)							
9	B/E μ -con version number (10 digit)							
10	B/E μ -con version number (1 digit)							
11	F/E μ -con version number (1000 digit)							
12	F/E μ -con version number (100 digit)							
13	F/E μ -con version number (10 digit)							
14	F/E 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) '.

1.10 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