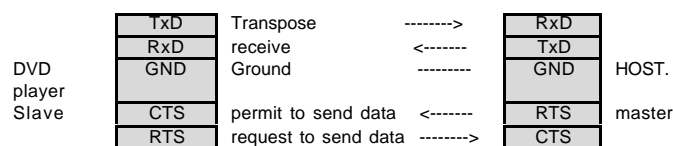


1. Outline

This contents are effective for the yamaha DVD player.

1.1 Connection

5 wire system



*When not connected, data sending to DVD player is prohibited (CTS port pull down).

1.2 Communication format

based on RS-232C format

Full duplex, start-stop synchronization communication

Baud rate : 9600bps
Data bits : 8
Parity : No
Stop bit : 1bit
Handshaking : Hardware

*RTS is keeps Low when the AC outlet are not plugged in.

When RTS keeps Low for over 10 seconds in spite of the AC outlet connection, there are some troubles.

1.3 Data block timeout

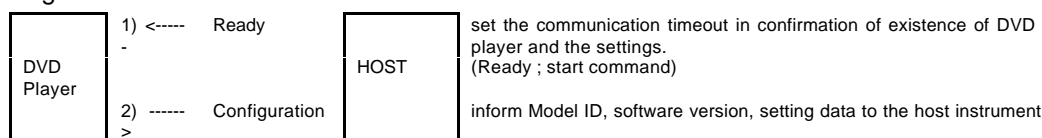
Please set the data sending timeout (from the start of the data block to the end) to 500msec.

That is, data block sending will finish at most in 500 msec.

When the data block sending doesn't finish in 500 msec, there are some troubles. Please cancel the data sent from the host instrument.

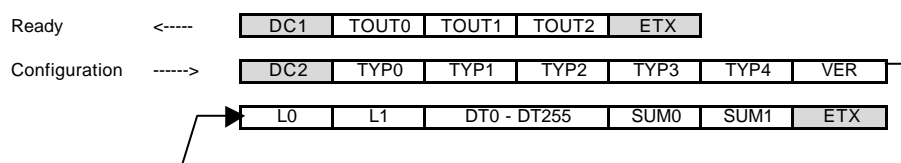
2. Start transactions

*Publishing the start command



*Please retry sending data if DVD Player won't send back Configuration in 1sec. after sending Ready. When no configuration is sent back after the 5th sending, please stop to send any data after that. In this case DVD Player may be plugged out or have some problem.

*Even while the system is wait, it is possible to corresponding with DVD Player.



*TYPx : Model ID
*VER : Software Version
*SUM : the sum of all data except for the header and footer

function name	Function	data (ASCII)	range (HEX)
TOUT0 - 2	communication timeout	0 - 9, A - F	0 - 0xFFFF

*timeout between the header and the footer

*timeout=0 means no timeout

function name	Function	data (ASCII)	range (HEX)
TYP0 - 4	Model ID	0 - 9, A - F	Voluntary
VER	Software version	A - Z	Voluntary
L0 - 1	data length = '08'	0 - 9, A - F	1 - 0xFF
DT1	Supported baud rate and parity	0 - 9, A - F	0 - 0xF
DT2	communication maximum buffer size (MSB)	0 - 9, A - F	0 - 0xF
DT3	communication maximum buffer size (LSB)	0 - 9, A - F	0 - 0xF
DT4	communication timeout (MSB)	0 - 9, A - F	0 - 0xF
DT5	communication timeout (LSB)	0 - 9, A - F	0 - 0xF
DT6	Flow control 0: supported hardware flow control 1: supported software flow control	0/1	0-1
DT7	System command status 0: OK 1: busy	0/1	0-1
DT8	System Power condition 0 : Off 1: ON	0/1	0-1
SUM0	upper 4 bit of SUM	0 - 9, A - F	0 - 0xF
SUM1	lower 4 bit of SUM	0 - 9, A - F	0 - 0xF

TYP0 - 4: Model ID

Model	TYP0	TYP1	TYP2	TYP3	TYP4
DVD-CX1	"C"	"0"	"0"	"5"	"5"
DVD-C940	"C"	"0"	"0"	"6"	"6"
DVD-S2300Mk2	"C"	"0"	"0"	"6"	"8"
DVD-S2400	T.B.D				

VER: Software version

Model	VER
DVD-CX1	"C"
DVD-C940	"C"
DVD-S2300Mk2	"C"
DVD-S2400	"C"

DT1 : Supported baud rate and parity

DT1 (ASCII)	DT1 (HEX)	Supported baud rate and parity	DT1 (ASCII)	DT1 (HEX)	Supported baud rate and parity
@	0x40	Only 9600bps parity none	'	0x60	Only 9600bps parity alterable
A	0x41	Only 19200bps parity none	a	0x61	Only 19200bps parity alterable
B	0x42	Only 38400bps parity none	b	0x62	Only 38400bps parity alterable
C	0x43	19200bps / 38400bps parity none	c	0x63	19200bps / 38400bps parity alterable
D	0x44	57600bps parity none	d	0x64	57600bps parity alterable
E	0x45	19200bps / 57600bps parity none	e	0x65	19200bps / 57600bps parity alterable
F	0x46	38400bps / 57600bps parity none	f	0x66	38400bps / 57600bps parity alterable
G	0x47	19200bps / 38400bps / 57600bps parity none	g	0x67	19200bps / 38400bps / 57600bps parity alterable
H	0x48	Only 115200bps parity none	h	0x68	Only 115200bps parity alterable
I	0x49	19200bps / 115200bps parity none	i	0x69	19200bps / 115200bps parity alterable
J	0x4A	38400bps / 115200bps parity none	j	0x6A	38400bps / 115200bps parity alterable
K	0x4B	19200bps / 38400bps / 115200bps parity none	k	0x6B	19200bps / 38400bps / 115200bps parity alterable
L	0x4C	57600bps / 115200bps parity none	l	0x6C	57600bps / 115200bps parity alterable
M	0x4D	19200bps / 57600bps / 115200bps parity none	m	0x6D	19200bps / 57600bps / 115200bps parity alterable
N	0x4E	38400bps / 57600bps / 115200bps parity none	n	0x6E	38400bps / 57600bps / 115200bps parity alterable
O	0x4F	19200bps / 38400bps / 57600bps / 115200bps parity none	o	0x6F	19200bps / 38400bps / 57600bps / 115200bps parity alterable

3. Commands

*Normal commands Format

DVD-CX1 <----- Normal commands HOST Normal commands from external instruments

*DVD Player accepts commands only while the power is on.
(except for Power commands and System commands*)

*Please do not send commands while the system status is wait. It is permitted to send commands after DVD Player reports that the system status turned into OK.

*No cancel command for a command which has already sent to DVD Player, basically. The last command sent is high priority on a kind of the report command.

*Please retry sending the same command when DVD Player sends no reports for over 1 sec. After Host send a command. In this case, if there are no reports from DVD Player after the 5th re-sending, please abort sending commands and re-start communication from the start transactions.

*When the command switch(SW) equals "0", DVD Player act the same action and indicates the same FL/On screen displays, as it does when it receive a command from I/R.

Normal command <-----	STX	SW	CMDT0	CMDT1	CMDT2	CMDT3	ETX
	SW=0	:remote control (Operation Command)	4 byte remote control code				
	SW=1	common command code	command	data			
	SW=3	:packet data					
	SW=4	:system command	command	data			

function name	Function	data (ASCII)	range (HEX)
SW	command switch	0 - 9	0 - 9
CMDT0 - 3	command & data	0 - 9, A - F	variable

*Changing the SW, the data number of the command/data can be varied.

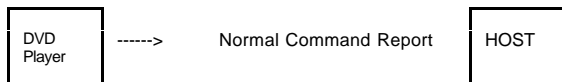
SW=0 : 4 byte command for remote control code

SW=1 : Yamaha common command code

SW=3 : 4byte packet data

SW=4 : 2 byte command 10 - FF (HEX expression in ASCII)

*Normal command report format



*The system reports the guard status which indicates if transaction is prohibited or not.

Report command ----->	STX	TYP	GRD	SW	RCMD0	RCMD1	RCMD2	ETX
					command			

Function name	function	data (ASCII)	range (HEX)
TYP	Control type	0 - 9	0 - 9
GRD	guard status	0 - 9	0 - 9
SW	Command Switch	0 - 9, A - F	0 - 0xF
RCMD0, 1, 2	Command	0 - 9, A - F	0 - 0xFFF

<Control type> This indicates for which type of control the report command is.

TYP	Control type
0	Control by RS-232C
1	Control by remote controller (I/R)
2	Control by keys in the unit
3	Control by system
4	Control by encoder (only receiver)

<Guard status> This indicates guard status against all control command

GRD	Guard status
0	no guard
1	Guarded by system
2	Guarded by setting

<SW : Category Switch> This indicates the category of command .

SW	Category
0,1	ALL category
2,3	Receiver
4-6	Optical system(CD,DVD,CDR)
7	Projector

* Details as the Normal commands and the Normal reports

Normal command table

Command	SW	CMDT0	CMDT1	CMDT2	CMDT3
Report command enable	1	0	0	0	Parameter
Report command Interval	1	1	0	0	Parameter
Set baud rate	1	2	0	0	Parameter
Report player status	4	1	0	0	0
remote control	0	Remote code			

Normal report table

Command	TYP	GRD	SW	RCMD0	RCMD1	RCMD2
Report command enable	@	0/1	0	2	0	Parameter
Report command Interval	1	0/1	0	3	0	Parameter
Set baud rate	1	0/1	0	4	0	Parameter
Report player status	4	0/1	4	0	Parameter	
remote control	0	0/1	4	Remote data code		Parameter

1. Report command enable

Command	Report
1 STX	1 STX
2 '1' [0x31] : SW.	2 '@' [0x40] : TYP
3 '0' [0x30] : CMDT0	3 '0/1' [0x30,31] : GRD
4 '0' [0x30] : CMDT1	4 '0' [0x30] : SW
5 '0' [0x30] : CMDT2	5 '2' [0x32] : RCMD0
6 '0/1' [0x30, 31] : CMDT3	6 '0' [0x30] : RCMD1
7 ETX	7 'x' [0x30,31] : RCMD2
	8 ETX

CMDT3

Codes	Means	Notes
'0' [0x30]	Report Enable	Power On Default
'1' [0x31]	Report Disable	

RCMD2

Codes	Means	Notes
'0' [0x30]	Current mode is Report Enable	
'1' [0x31]	Current mode is Report Disable	

2. Report command Interval

Command	Report
1 STX	1 STX
2 '1' [0x31] : SW.	2 '@' [0x40] : TYP
3 '1' [0x31] : CMDT0	3 '0/1' [0x30,31] : GRD
4 '0' [0x30] : CMDT1	4 '0' [0x30] : SW
5 '0' [0x30] : CMDT2	5 '3' [0x33] : RCMD0
6 'x' [0x30- 38] : CMDT3	6 '0' [0x30] : RCMD1
7 ETX	7 'x' [0x30-39] : RCMD2
	8 ETX

CMDT3 / RCMD2

Codes	Means	Notes
'0' [0x30]	Real time	
'1' [0x31]	50ms	
'2' [0x30]	100ms	
'3' [0x31]	150ms	
'4' [0x30]	200ms	Power On Default
'5' [0x31]	250ms	
'6' [0x30]	300ms	
'7' [0x30]	350ms	
'8' [0x31]	400ms	

3. Set baud rate

Command	Report
1 STX	1 STX
2 '1' [0x31] : SW.	2 '@' [0x40] : TYP
3 '2' [0x33] : CMDT0	3 '0/1' [0x30,31] : GRD
4 '0' [0x30] : CMDT1	4 '0' [0x30] : SW
5 '0' [0x30] : CMDT2	5 '4' [0x33] : RCMD0
6 'x' [0x30-39] : CMDT3	6 '0' [0x30] : RCMD1
7 ETX	7 'x' [0x30-39] : RCMD2
	8 ETX

CMDT3 / RCMD2

Codes	Means	Notes
'0' [0x30]	9600bps / Non Party	
'1' [0x31]	19200bps / Non Party	
'2' [0x30]	38400bps / Non Party	
'5' [0x31]	9600bps / Even Party	
'6' [0x30]	19200bps / Even Party	
'7' [0x30]	38400bps / Even Party	

4. Report player status

Command	Report
1 STX	1 STX
2 '4' [0x34] : SW.	2 '@' [0x40] : TYP
3 '1' [0x31] : CMDT0	3 '0/1' [0x30,31] : GRD
4 '0' [0x30] : CMDT1	4 '4' [0x30] : SW
5 '0' [0x30] : CMDT2	5 '0' [0x35] : RCMD0
6 '0' [0x30] : CMDT3	6 'x' [0x30-39,41-46] : RCMD1
7 ETX	7 'x' [0x30-39,41-46] : RCMD2
	8 ETX

RCMD1 2

RCMD 1-2	Player Status	RCMD 1-2	Player Status
00	Power On Mode	20	SLOW Forward Level 1
01	Power off Mode	21	SLOW Forward Level 2
02	Tray Open	22	SLOW Forward Level 3
03	Tray Close	23	SLOW Forward Level 4
04	TOC Read 0	24	SLOW Forward Level 5
05	TOC Read 1		
06	TOC Read 2	30	SLOW Backward Level 1
07	TOC Read 3	31	SLOW Backward Level 2
08	TOC Read 4	32	SLOW Backward Level 3
09	NODISC	33	SLOW Backward Level 4
0A	Seek	34	SLOW Backward Level 5
0B	STOP (displayed TOC)		
		40	SEARCH Forward Level 1
0D	STOP (resume)	41	SEARCH Forward Level 2
0E	STOP(idle)	42	SEARCH Forward Level 3
0F	No play	43	SEARCH Forward Level 4
10	PLAY	44	SEARCH Forward Level 5
11	STILL Forward		
12	STILL SLOW Forward	50	SEARCH Backward Level 1
13	STILL SLOW Backward	51	SEARCH Backward Level 2
14	STILL Backward(during Reverse play)	52	SEARCH Backward Level 3
15	NAVI STILL	53	SEARCH Backward Level 4
		54	SEARCH Backward Level 5
19	Disc Information read and finished	60	Disc Seek
		70	Player Mode 1
		71	Player Mode 2
		F0	Test Mode

5. Remote control

Command	Report
1 STX	1 STX
2 '0' [0x30] : SW.	2 '@' [0x40] : TYP
3 'x' [0x30-39,41-46] : CMDT0	3 '0/1' [0x30,31] : GRD
4 'x' [0x30-39,41-46] : CMDT1	4 '4' [0x30] : SW
5 'x' [0x30-39,41-46] : CMDT2	5 'x' [0x38-39,41-46] : RCMD0
6 'x' [0x30-39,41-46] : CMDT3	6 'x' [0x30-39,41-46] : RCMD1
7 ETX	7 'x' [0x30-39] : RCMD2
	8 ETX

Yamaha DVD Players RS-232C Protocol

remote control code and report

S : Supported, N : Not Supported

		Remote Code		Report			DVD-CX1	DVD-C940	DVD-S2300 Mk2
Function	State	CDMT0,1	CMDT2,3	RCMD 0	RCMD1	RCMD2			
Power ON/OFF	OFF	7C	80	8	0	0	S	S	S
	ON	7C	80	8	0	1	S	S	S
OPEN/CLOSE	CLOSE	7C	81	8	1	0	S	S	S
	OPEN	7C	81	8	1	1	S	S	S
PLAY	-	7C	82	8	2	0	S	S	S
PAUSE	-	7C	83	8	3	0	S	S	S
STOP	-	7C	85	8	5	0	S	S	S
SEARCH -	-	7C	86	8	6	0	S	N	S
SEARCH +	-	7C	87	8	7	0	S	N	S
DISCSKIP -	-	7C	8A	8	A	0	S	S	N
DISCSKIP +	-	7C	8B	8	B	0	S	S	N
Numeric 0	-	7C	93	9	3	0	S	S	S
Numeric 1	-	7C	94	9	4	0	S	S	S
Numeric 2	-	7C	95	9	5	0	S	S	S
Numeric 3	-	7C	96	9	6	0	S	S	S
Numeric 4	-	7C	97	9	7	0	S	S	S
Numeric 5	-	7C	98	9	8	0	S	S	S
Numeric 6	-	7C	99	9	9	0	S	S	S
Numeric 7	-	7C	9A	9	A	0	S	S	S
Numeric 8	-	7C	9B	9	B	0	S	S	S
Numeric 9	-	7C	9C	9	C	0	S	S	S
Numeric +10/ >10	-	7C	9D	9	D	0	S	N	S
CANCEL(CLEAR)	-	7C	9F	9	F	0	S	N	S
PROGRAM	-	7C	A0	A	0	0	S	S	S
RANDOM	-	7C	A1	A	1	0	S	S	S
REPEAT MODE	-	7C	A3	A	3	0	S	S	S
REPEAT A-B	-	7C	A4	A	4	0	S	S	S
DISPPLAY ON/OFF	-	7C	A6	A	6	0	S	S	S
TIME		7C	A8	A	8	0	N	N	S
DIMMER		7C	A9	A	9	0	N	N	S
SUBTITLE	-	7C	AA	A	A	0	S	S	S
SETUP	-	7C	AC	A	C	0	S	N	S
AUDIO	-	7C	AD	A	D	0	S	S	S
ANGLE	-	7C	AE	A	E	0	S	S	S
TOP MENU	-	7C	B1	B	1	0	S	S	S
MENU	-	7C	B2	B	2	0	S	S	S
CURSOL DOWN	-	7C	B3	B	3	0	S	S	S
CORSOL UP	-	7C	B4	B	4	0	S	S	S
CORSOL LEFT	-	7C	B5	B	5	0	S	S	S
CORSOL RIGHT	-	7C	B6	B	6	0	S	S	S
RETURN	-	7C	B7	B	7	0	S	S	S
SELECT(ENTER)	-	7C	B8	B	8	0	S	S	S
SKIP -	-	7C	B9	B	9	0	S	S	S
SKIP +	-	7C	BA	B	A	0	S	S	S
PLAY MODE	-	7C	BD	B	D	0	S	N	S
DISC 1	-	7C	D1	D	1	0	S	S	N
DISC 2	-	7C	D2	D	2	0	S	S	N
DISC 3	-	7C	D3	D	3	0	S	S	N
DISC 4	-	7C	D4	D	4	0	S	S	N
DISC 5	-	7C	D5	D	5	0	S	S	N
MARKER		7C	D8	D	8	0	S	N	S
VIDEO ON/OFF	-	7C	D9	D	9	0	S	N	S
PROGRESSIVE	-	7C	DA	D	A	0	S	N	S
GROUP +	-	7C	DD	D	D	0	S	N	S
PAGE +	-	7C	DF	D	F	0	S	N	S

Yamaha DVD Players RS-232C Protocol

PLAYER MODE	PIAAYER MODE 1	7C	E0	E	0	0	N	N	S
	PLAYER MODE 2	7C	E0	E	0	1	N	N	S
MULTI/2ch		7C	E1	E	1	0	N	N	S
PLAYMODE NORMAL	= -	7C	F0	F	0	0	S	S	S
PLAYMODE RANDOM	= -	7C	F1	F	1	0	S	S	S
PLAY MODE PROGRAM	= -	7C	F2	F	2	0	S	S	S
REPEAT OFF		7C	F3	F	3	0	S	S	S
REPEAT ALL	-	7C	F5	F	5	0	S	S	S
REPEAT ALL	-	7C	F5	F	5	0	S	S	S
POWER ON	-	7C	F6	F	6	0	S	S	S
POWER OFF	-	7C	F7	F	7	0	S	S	S

*Response of the guard status to the remote control commands (DVD-CX1)

Playback Status	PWR ON	PWR OFF	TRAY	DISC SEAR CH	TOC	Seek	STOP	PLAY	STILL	SLOW	SEAR CH	NODIS C	NOPLA Y
Function													
Power ON/OFF	0	0	0	0	0	0	0	0	0	0	0	0	0
OPEN/CLO SE	0	0	0	0	0	0	0	0	0	0	0	0	0
PLAY	0	0	0	0	0	0	0	0	0	0	0	1	1
PAUSE	1	1	1	1	1	1	1	0	1	0	0	1	1
STOP	1	1	1	1	0	0	0	0	0	0	0	1	1
SEARCH -	1	1	1	1	1	1	1	0	1 0(VCD, DVDV, DVDA)	0	0	1	1
SEARCH +	1	1	1	1	1	1	1	0	1 0(VCD, DVDV, DVDA)	0	0	1	1
SKIP -	1	1	1	1	1	0	0	0	0	0	0	1	1
SKIP +	1	1	1	1	1	0	0	0	0	0	0	1	1
DISCSKIP -	1	1	1	0	0	0	0	0	0	0	0	0	0
DISCSKIP +	1	1	1	0	0	0	0	0	0	0	0	0	0
Numeric 0	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 1	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 2	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 3	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 4	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 5	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 6	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 7	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 8	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 9	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric +10/ >10	1	1	1	1	1	0	0	0	0	0	0	1	1
CANCEL(CL EAR)	1	1	1 0(On Screen ON)	1	1	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)
PROGRAM	1	1	1	1	1	1	0	1	1	1	1	1	1
RANDOM	1	1	1	1	1	1	0	1	1	1	1	1	1
REPEAT MODE	1	1	0	0	0	0	0	0	0	0	0	1 0(ALL REP)	1 0(ALL REP)
REPEAT A- B	1	1	1	1	1	1	1	0	0	0	0	1	1
DISPPLAY ON/OFF	1	1	1	1	1	0	0	0	0	0	0	1	1
SUBTITLE	1	1	1	1	1	1 0(DVD- V)	1	1 0(DVD- V)	1 0(DVD- V)	1 0(DVD- V)	1 0(DVD- V)	1	1
SETUP	1	1	0	0	1	1	0	1	1	1	1	0	0
AUDIO	1	1	1	1	1	1 0(VCD, DVD- V,DVD- A)	1 0(VCD)	1 0(VCD, DVD- V,DVD- A)	1 0(VCD, DVD- V,DVD- A)	1 0(VCD, DVD- V,DVD- A)	1 0(VCD, DVD- V,DVD- A)	1	1
ANGLE	1	1	1	1	1	1	1	1	1	1	1	1	1

Yamaha DVD Players RS-232C Protocol

						0(DVD-V)		0(DVD-V)	0(DVD-V)	0(DVD-V)	0(DVD-V)		
TOP MENU	1	1	1	1	1	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1	1
MENU	1	1	1	1	1	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	1 0(DVD-V,DVD-A)	0	0
CURSOL DOWN	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
CORSOL UP	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
CORSOL LEFT	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
CORSOL RIGHT	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
RETURN	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
SELECT(ENTER)	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0{VCD-PBC} 0(On Screen ON) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)	1 0(Setu p on) 0(DVD-V,DVD-A)
SKIP -	1	1	1	1	1	0	0	0	0	0	0	1	1
SKIP +	1	1	1	1	1	0	0	0	0	0	0	1	1
PLAY MODE	1	1	1	1	1	1	0	1	1	1	1	1	1
DISC 1	1	1	0	0	0	0	0	0	0	0	0	0	0
DISC 2	1	1	0	0	0	0	0	0	0	0	0	0	0
DISC 3	1	1	0	0	0	0	0	0	0	0	0	0	0
DISC 4	1	1	0	0	0	0	0	0	0	0	0	0	0
DISC 5	1	1	0	0	0	0	0	0	0	0	0	0	0
MARKER VIDEO ON/OFF	1	1	1	1	1	0	0	0	0	0	0	1	1
PROGRESSIVE	1	1	0	0	0	0	0	0	0	0	0	0	0
GROUP +	1	1	1	1	1	1 0(DVD-A)	1 0(DVD-A)	1 0(DVD-A)	1 0(DVD-A)	1 0(DVD-A)	1 0(DVD-A)	1	1
PAGE +	1	1	1	1	1	1 0(DVD-A)	1	1 0(DVD-A)	1 0(DVD-A)	1	1 0(DVD-A)	1	1
PLAYMODE = NORMAL	1	1	1	1	1	1	0	1	1	1	1	1	1
PLAYMODE = RANDOM	1	1	1	1	1	1	0	1	1	1	1	1	1
PLAY MODE = PROGRAM	1	1	1	1	1	1	0	1	1	1	1	1	1
REPEAT ALL	1	1	0	0	0	0	0	0	0	0	0	0	0
REPEAT OFF	1	1	0	0	0	0	0	0	0	0	0	0	0

Yamaha DVD Players RS-232C Protocol

POWER ON	1	0	1	1	1	1	1	1	1	1	1	1	1
POWER OFF	0	1	0	0	0	0	0	0	0	0	0	0	0

Yamaha DVD Players RS-232C Protocol

*Response of the guard status to the remote control commands (DVD-S2300MK2)

Playback Status Function	PWR ON	PWR OFF	TRAY	DISC SEAR CH	TOC	Seek	STOP	PLAY	STILL	SLOW	SEAR CH	NODIS C	NOPLA Y
Power ON/OFF	0	0	0	0	0	0	0	0	0	0	0	0	0
OPEN/CLOSE	0	0	0	0	0	0	0	0	0	0	0	0	0
PLAY	0	0	0	0	0	0	0	0	0	0	0	1	1
PAUSE	1	1	1	1	1	1	1	0	1	0	0	1	1
STOP	1	1	1	1	0	0	0	0	0	0	0	1	1
SEARCH -	1	1	1	1	1	1	1	0	1 0(VCD, DVDV, DVDA)	0	0	1	1
SEARCH +	1	1	1	1	1	1	1	0	1 0(VCD, DVDV, DVDA)	0	0	1	1
SKIP -	1	1	1	1	1	0	0	0	0	0	0	1	1
SKIP +	1	1	1	1	1	0	0	0	0	0	0	1	1
DISCSKIP -	1	1	1	1	1	1	1	1	1	1	1	1	1
DISCSKIP +	1	1	1	1	1	1	1	1	1	1	1	1	1
Numeric 0	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 1	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 2	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 3	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 4	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 5	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 6	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 7	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 8	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric 9	1	1	1	1	1	0	0	0	0	0	0	1	1
Numeric +10/ >10	1	1	1	1	1	0	0	0	0	0	0	1	1
CANCEL(CLEAR)	1	1	1 0(On Screen ON)	1	1	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)	1 0(On Screen ON)
PROGRAM	1	1	1	1	1	1	0	1	1	1	1	1	1
RANDOM	1	1	1	1	1	1	0	1	1	1	1	1	1
REPEAT MODE	1	1	1	1	1	1	1	0	1	1	1	1	1
REPEAT A-B	1	1	1	1	1	1	1	0	0	0	0	1	1
DISPPLAY ON/OFF	1	1	1	1	1	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	1	1
TIME	1	1	1	1	1	1	1	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1	1
DIMMER	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)	1 0(SAC D)
SUBTITLE	1	1	1	1	1	1 0(DVD-V)	1	1 0(DVD-V)	1 0(DVD-V)	1 0(DVD-V)	1 0(DVD-V)	1	1
SETUP	1	1	0	0	1 0(SAC D)	1	0	0	0	0	0	0	1 0(SAC D)
AUDIO	1	1	1	1	1	1 0(VCD, DVD-V, DVD-A)	1 0(VCD)	1 0(VCD, DVD-V, DVD-A)	1 0(VCD, DVD-V, DVD-A)	1 0(VCD, DVD-V, DVD-A)	1 0(VCD, DVD-V, DVD-A)	1	1
ANGLE	1	1	1	1	1	1 0(DVD-V)	1	1 0(DVD-V)	1 0(DVD-V)	1 0(DVD-V)	1 0(DVD-V)	1	1
TOP MENU	1	1	1	1	1	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1	1
MENU	1	1	1	1	1	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1 0(DVD-V, DVD-A)	1	1
CURSOL DOWN	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD-V, DVD-A)	1 0(Setu p on) 0(DVD-V, DVD-A)	1 0(On Screen ON) 0(DVD-V, DVD-A)	1 0(On Screen ON) 0(DVD-V, DVD-A)	1 0(On Screen ON) 0(DVD-V, DVD-A)	1 0(On Screen ON) 0(DVD-V, DVD-A)	1 0(Setu p on) 0(DVD-V, DVD-A)	1 0(Setu p on) 0(DVD-V, DVD-A)
CORSOL UP	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On)	1 0(Setu p on)	1 0(On)	1 0(On)	1 0(On)	1 0(On)	1 0(Setu p on)	1 0(Setu p on)

Yamaha DVD Players RS-232C Protocol

			p on)	p on)		Screen ON) 0(DVD- V,DVD- A)	p on) 0(DVD- V,DVD- A)	Screen ON) 0(DVD- V,DVD- A)	Screen ON) 0(DVD- V,DVD- A)	Screen ON) 0(DVD- V,DVD- A)	Screen ON) 0(DVD- V,DVD- A)	p on) 0(DVD- V,DVD- A)	p on) 0(DVD- V,DVD- A)
CORSOL LEFT	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)
CORSOL RIGHT	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)
RETURN	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)
SELECT(EN TER)	1	1	1 0(Setu p on)	1 0(Setu p on)	1	1 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0{VCD- PBC} 0(On Screen ON) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)	1 0(Setu p on) 0(DVD- V,DVD- A)
SKIP -	1	1	1	1	1	0	0	0	0	0	0	1	1
SKIP +	1	1	1	1	1	0	0	0	0	0	0	1	1
PLAY MODE	1	1	1	1	1	1	0	1	1	1	1	1	1
DISC 1	1	1	1	1	1	1	1	1	1	1	1	1	1
DISC 2	1	1	1	1	1	1	1	1	1	1	1	1	1
DISC 3	1	1	1	1	1	1	1	1	1	1	1	1	1
DISC 4	1	1	1	1	1	1	1	1	1	1	1	1	1
DISC 5	1	1	1	1	1	1	1	1	1	1	1	1	1
MARKER	1	1	1	1	1	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	1	1
VIDEO ON/OFF	1	1	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)
PROGRESS IVE	1	1	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)	0 1(SAC D)
GROUP +	1	1	1	1	1	1 0(DVD- A)	1 0(DVD- A)	1 0(DVD- A)	1 0(DVD- A)	1 0(DVD- A)	1 0(DVD- A)	1	1
PAGE +	1	1	1	1	1	1 0(DVD- A)	1	1 0(DVD- A)	1 0(DVD- A)	1	1 0(DVD- A)	1	1
PLAYER MODE	0	1	0	0	0	0	0	0	0	0	0	0	0
MULTI/2CH	1	1	1 0(SAC D)	1 0(SAC D)	1	1	1 0(SAC D)	1	1	1	1	1	1
PLAYMODE = NORMAL	1	1	1	1	1	1	0	1	1	1	1	1	1
PLAYMODE = RANDOM	1	1	1	1	1	1	0	1	1	1	1	1	1
PLAY MODE = PROGRAM	1	1	1	1	1	1	0	1	1	1	1	1	1
REPEAT ALL	1	1	1	1	1	1	1	0	1	1	1	1	1
REPEAT OFF	1	1	1	1	1	1	1	0	1	1	1	1	1
POWER ON	1	0	1	1	1	1	1	1	1	1	1	1	1
POWER OFF	0	1	0	0	0	0	0	0	0	0	0	0	0

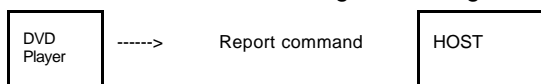
Yamaha DVD Players RS-232C Protocol

Details of playback Status

	Playback Status	RCMD 0-2	Playback Status
PWR ON	Power On Mode	SLOW	SLOW Forward Level 1
PWR OFF	Power off Mode		SLOW Forward Level 2
TRAY	Tray Open		SLOW Forward Level 3
	Tray Close		SLOW Forward Level 4
TOC	TOC Read 0		SLOW Forward Level 5
	TOC Read 1		SLOW Backward Level 1
	TOC Read 2		SLOW Backward Level 2
	TOC Read 3		SLOW Backward Level 3
	TOC Read 4		SLOW Backward Level 4
NODISC	NODISC	SEARCH	SLOW Backward Level 5
SEEK	Seek		SEARCH Forward Level 1
STOP	STOP (displayed TOC)		SEARCH Forward Level 2
	STOP (resume)		SEARCH Forward Level 3
	STOP(Idle)		SEARCH Forward Level 4
NO PLAY	No play		SEARCH Forward Level 5
			SEARCH Backward Level 1
PLAY	PLAY		SEARCH Backward Level 2
STILL	STILL Forward		SEARCH Backward Level 3
	STILL SLOW Forward		SEARCH Backward Level 4
	STILL SLOW Backward		SEARCH Backward Level 5
	STILL Backward(during Reverse play)		
	NAVI STILL		

3. control report

*Reports which informs the change of settings controlled by the command and system.



*Report commands are divided into following three types.

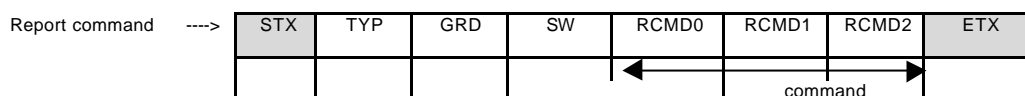
System state report	: This report command informs the system state, such as busy, when it changes.
Playback state report	: This report command informs the DVD Player states, when the states is changed.
Operation report	: This report command informs the last state of the setting which is controlled by I/R, RS-232C, or keys, when the transactions are completed.

*The system reports the guard status which indicates if transaction is prohibited or not.

*While the system is power off status, DVD Player accepts only following command.

1. POWER ON/OFF: 0x7c80
2. OPEN/CLOSE : 0x7c81
3. PLAY :0x7c82
4. POWER ON :0x7cF6

If a remote control command is issued except previous four codes, "Guarded by system " is answered.



Function name	function	data (ASCII)	range (HEX)
TYP	Control type	0 - 9	0 - 9
GRD	Guard status	0 - 9	0 - 9
SW	Command Switch	0 - 9, A - F	0 - 0xF
RCMD0, 1, 2	Command	0 - 9, A - F	0 - 0xFFF

<Control type> This indicates for which type of control the report command is.

TYP	Control type
0	Control by RS-232C
1	Control by remote controller (I/R)
2	Control by keys in the unit
3	Control by system
4	Control by encoder (only receiver)

<Guard status> This indicates guard status against all control command

GRD	Guard status
0	no guard
1	Guarded by system
2	Guarded by setting

<SW : Category Switch> This indicates the category of command .

SW	Category
0,1	ALL category
2,3	Receiver
4-6	Optical system(CD,DVD,CDR)
7	Projector

1. System status reports

Command	Report
1	1 STX
2	2 '0' [0x30] : TYP
3	3 '0' [0x30] : GRD
4	4 '0' [0x30] : SW
5	5 'x' [0x30-39] : RCMD0
6	6 'x' [0x30-39] : RCMD1
7	7 'x' [0x30-39] : RCMD2
	8 ETX

RCMD0 - 2

RCMD0	RCMD1 - 2	Means	Notes
0	00	System OK (no guard)	ready for accepting the control commands
0	01	System Busy	start of the term prohibits sending commands
0	02	Power off	report against the command which cannot be accepted when the Power is Off

*DVD Player sends this report when the system is reset or the power turns off.
It can be used for observation of the system revival.

			Warning reports
1	00	over current	
1	01	DC Detect	
1	02	power trouble	
1	03	over heat	
1	04	Traverse unit trouble	
1	05	Mocha unit trouble	

2. player status report

Command	Report
1	1 STX
2	2 '0,1,2,3' [0x30-33] : TYP
3	3 '0' [0x30] : GRD
4	4 '4' [0x30] : SW
5	5 '0' [0x30] : RCMD0
6	6 'x' [0x30-39,41-46] : RCMD1
7	7 'x' [0x30-39,41-46] : RCMD2
	8 ETX

RCMD1 2

Same as Report player status

3. control report

Command	Report
1	1 STX
2	2 '0,1,2,3' [0x30-33] : TYP
3	3 '0/1' [0x30,31] : GRD
4	4 '4' [0x30] : SW
5	5 'x' [0x38-39,41-46] : RCMD0
6	6 'x' [0x30-39,41-46] : RCMD1
7	7 'x' [0x30-39] : RCMD2
	8 ETX

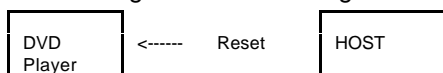
RCMD1 2

Same as remote control

4. Reset Command

*This command reset DVD Player's all current settings which can be controlled by RS-232C commands to factory presets.

*Resetting the stored settings should be thought to be a final solution.



*Please confirm the DVD Player settings from the Configuration after the reset transaction with 500msec's wait.

Ready

<----

DC3	DEL	DEL	DEL	ETX
-----	-----	-----	-----	-----

*recall factory preset of all data

5. Extended Commands

Extended control commands format

* DVD-CX1 and DVD-S2300MK2 do not support this command,. If Host issues this command, player does not answer anymore.

Extended control command <---

DC4	SW	Length 0	Length 1	Data 0	-	Data n (Max 255)	Upper 4 bit of SUM	Lower 4 bit of SUM	ETX
SW=3	:packet data	Data length		data		SUM			
SW=4	Extended command	Data length		data		SUM			

function name	Function	data (ASCII)	range (HEX)
SW	command switch	0 - 9	0 - 9
Length 0, 1	Data Length (max 255(0xff))	0 - 9, A-F	variable
Data0 - n	command data	0 - 9, A - F	variable
SUM	SUM data	0 - 9, A - F	variable

*Changing the SW, the data means the followings.

SW=0,1: Yamaha AV common code

SW=2 : Reserved receiver

SW=3 : Packet data

SW=4 : Extended command 10 - FF (HEX expression in ASCII)

Extended Commands report format

*DVD Player replays the extended command reports only for the extended control commands .

Extended command report --->

DC4	SW	Length 0	Length 1	Data 0	-	Data n (Max 255)	Upper 4 bit of SUM	Lower 4 bit of SUM	ETX
SW=3	:packet data	Data length		data		SUM			
SW=4	Extended command report	Data length		data		SUM			

function name	Function	data (ASCII)	range (HEX)
SW	command switch	0 - 9	0 - 9
Length 0, 1	Data Length (max 255(0xff))	0 - 9, A-F	variable
Data0 - n	report data	0 - 9, A - F	variable
SUM	SUM data	0 - 9, A - F	variable

*Changing the SW, the data means the followings.

SW=0,1: Yamaha AV common code

SW=2 : Reserved receiver

SW=3 : packet data

SW=4 : Extended command report 10 - FF (HEX expression in ASCII)

*Details as the extended commands and the extended report commands

Extended command table

Command	SW	Length 0	Length 1	Data0	Data1	Data2	-	Data n
				Command code		Return code	Parameter	
Get status and disc information	4			1	0			
Get 1 Disc information	4			1	2			
Get player information	4			1	3			
Load & Seek	4			2	0			

Return Code

0	Command accept
1	Guarded by system
2	Guarded by setting
3	Command code Unknown
4	Command parameter Error

Extended command detail

1. Get status and disc information

Command	Report
1 DC4	1 DC4
2 SW = 4	2 SW = 4
3 Command length (MSB)	3 Command length (MSB)
4 Command length (LSB)	4 Command length (LSB)
5 Command code (MSB)	5 Command code (MSB)
6 Command code (LSB)	6 Command code (LSB)
7 Reserved = '0'	7 Return Code
:	8 Current Drive Status (MSB)
20 Reserved = '0'	9 Current Drive Status (LSB)
21 Sum (MSB)	10 Play X Change Status
22 Sum (LSB)	11 Play Mode
23 ETX	12 Repeat play Mode
	13 Current Disc No
	14 Disc No.1 Type (MSB)
	15 Disc No.1 Type (LSB)
	16 Disc No.2 Type (MSB)
	17 Disc No.2 Type (LSB)
	18 Disc No.3 Type (MSB)
	19 Disc No.3 Type (LSB)
	20 Disc No.4 Type (MSB)
	21 Disc No.4 Type (LSB)
	22 Disc No.5 Type (MSB)
	23 Disc No.5 Type (LSB)
	24 Current Disc Data 1
	34 Current Disc Data 11
	35 Sum (MSB)
	36 Sum (LSB)
	37 ETX

Command Length = '10' (16)
Command Code = '10'

Command Length = '20' (32)
Command Code = '10'

Current Drive Status

00	Power On Mode	20	SLOW Forward Level 1
01	Power off Mode	21	SLOW Forward Level 2
02	Tray Open	22	SLOW Forward Level 3
03	Tray Close	23	SLOW Forward Level 4
04	TOC Read 0	24	SLOW Forward Level 5
05	TOC Read 1		
06	TOC Read 2	30	SLOW Backward Level 1
07	TOC Read 3	31	SLOW Backward Level 2
08	TOC Read 4	32	SLOW Backward Level 3
09	NODISC	33	SLOW Backward Level 4
0A	Seek	34	SLOW Backward Level 5
0B	STOP (displayed TOC)		
		40	SEARCH Forward Level 1

0D	STOP (resume)	41	SEARCH Forward Level 2
0E	STOP(Idle)	42	SEARCH Forward Level 3
0F	No play	43	SEARCH Forward Level 4
10	PLAY	44	SEARCH Forward Level 5
11	STILL Forward		
12	STILL SLOW Forward	50	SEARCH Backward Level 1
13	STILL SLOW Backward	51	SEARCH Backward Level 2
14	STILL Backward(during Reverse play)	52	SEARCH Backward Level 3
15	NAVI STILL	53	SEARCH Backward Level 4
		54	SEARCH Backward Level 5
19	Disc Information read and finished	60	Disc Seek
		70	Player Mode 1
		71	Player Mode 2
		F0	Test Mode

Play X Change Status

0	Tray Close (Not Play X Change)
1	Play X Change Open
2	Between Play X Change Close
3	Between Play X Change Open

Play Mode

0	Normal mode
1	Program mode
2	Random mode

Repeat Mode

0	No repeat
1	Repeat A point set
2	Repeat A-B mode
3	Repeat chapter/track mode
4	Repeat Title/Group mode
5	Repeat 1 disc
6	Repeat all disc

Current Disc

0	Table Is Home Position
1 – 5	Disc 1 –5
6 – e	Reserved
F	Disc Position Unknown (Between Disc Search)

Disc Type(MSB)

0	No Disc
1	CDDA
2	CDROM (Video CD)
3	DVD
4	DVD-RAM
5	DVD-RW
6	DVD-R
7	DVD+RW
8	SACD
9 – d	Reserved
E	No Play disc
F	Never check or Unknown

Disc Type(LSB)

	CD-DA	VCD	DVD	SACD
0	CD-DA	No PBC	DVD Video(OneSequentialPGC)	2-Channel Stereo Area
1	MP3	PBC	DVD Video(MultiSequentialPGC)	Multi Channel Area
2	DTS-CD		DVD Audio	

Current Disc Data

	CD-DA	VCD	DVD Video	DVD Audio	SACD
Data 1	-		-	Group (0 –9)	Track (MSB)
Data 2	Track (MSB)		Title (MSB)	Track (MSB)	Track
Data 3	Track (LSB)		Title (LSB)	Track (LSB)	Track (LSB)
Data 4	-		Chapter (MSB)	-	-
Data 5	-		Chapter (LSB)	-	-
Data 6	Hour (MSB)		Hour (MSB)	Hour (MSB)	Hour (MSB)
Data 7	Hour (LSB)		Hour (LSB)	Hour (LSB)	Hour (LSB)
Data 8	Min (MSB)		Min (MSB)	Min (MSB)	Min (MSB)
Data 9	Min (LSB)		Min (LSB)	Min (LSB)	Min (LSB)

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Data 10	Sec (MSB)	Sec (MSB)	Sec (MSB)	Sec (MSB)
Data 11	Sec (LSB)	Sec (LSB)	Sec (LSB)	Sec (LSB)

2. Get 1 disc information

	Command
1	DC4
2	SW = 4
3	Command length (MSB)
4	Command length (LSB)
5	Command code (MSB)
6	Command code (LSB)
7	Disc Number
8	Reserved = '0'
:	:
20	Reserved = '0'
21	Sum (MSB)
22	Sum (LSB)
23	ETX

Command Length = '10' (16)

Command Code = '11'

	Report	Report(burst data)
1	DC4	DC3
2	SW = 4	SW = 4
3	Command length (MSB)	Command length (MSB)
4	Command length (LSB)	Command length (LSB)
5	Command code (MSB)	Command code (MSB)
6	Command code (LSB)	Command code (LSB)
7	Return Code	Return Code
8	Disc Type (MSB)	Disc Type (MSB)
9	Disc Type (LSB)	Disc Type (LSB)
10	Disc Data 1	Disc Data 1
:	:	:
:	:	:
258	Disc Data 249	Disc Data 249
259	Disc Data 250	Disc Data 250
260	Sum (MSB)	Sum (MSB)
261	Sum (LSB)	Sum (LSB)
262	ETX	ETX

Command Length = 'FF' (255)

Command Code = '11'

Command Length = 'FF' (255)

Command Code = '11'

Disc Type : refer Disc Type in 'Get Status and disc information' command

Disc Information (Disc Type = CD ,VCD)

	First transfer (DC4)	burst transfer (DC3)	burst transfer (DC3)
Data 1	First Track No.(MSB)	Reserved = '0'	Reserved = '0'
Data 2	First Track No.(LSB)	:	:
Data 3	Last Track No. (MSB)	:	:
Data 4	Last Track No. (LSB)	:	:
Data 5	Lead out Time Min. (MSB)	:	:
Data 6	Lead out Time Min. (LSB)	:	:
Data 7	Lead out Time Sec (MSB)	:	:
Data 8	Lead out Time Sec (LSB)	:	:
Data 9	Lead out Time Frame (MSB)	:	:
Data 10	Lead out Time Frame (LSB)	Reserved = '0'	Reserved = '0'
Data 11	Track1 Start Min. (MSB)	Track41 Start Min. (MSB)	Track81 Start Min. (MSB)
Data 12	Track1 Start Min. (LSB)	Track41 Start Min. (LSB)	Track81 Start Min. (LSB)
Data 13	Track1 Start Sec (MSB)	Track41 Start Sec (MSB)	Track81 Start Sec (MSB)
Data 14	Track1 Start Sec (LSB)	Track41 Start Sec (LSB)	Track81 Start Sec (LSB)
Data 15	Track1 Start Frame (MSB)	Track41 Start Frame (MSB)	Track81 Start Frame (MSB)
Data 16	Track1 Start Frame (LSB)	Track41 Start Frame (LSB)	Track81 Start Frame (LSB)
	:	:	:
	:	:	Track99 Start Min. (MSB)
	:	:	Track99 Start Min. (LSB)
	:	:	Track99 Start Sec (MSB)
	:	:	Track99 Start Sec (LSB)
	:	:	Track99 Start Frame (MSB)
	:	:	Track99 Start Frame (LSB)
	:	:	Reserved = '0'
Data 245	Track40 Start Min. (MSB)	Track80 Start Min. (MSB)	:
Data 246	Track40 Start Min. (LSB)	Track80 Start Min. (LSB)	:
Data 247	Track40 Start Sec (MSB)	Track80 Start Sec (MSB)	:
Data 248	Track40 Start Sec (LSB)	Track80 Start Sec (LSB)	:
Data 249	Track40 Start Frame (MSB)	Track80 Start Frame (MSB)	:
Data 250	Track40 Start Frame (LSB)	Track80 Start Frame (LSB)	Reserved = '0'

Disc Information (Disc Type = DVD Video)

Undefined (reply return code = 4 Command parameter Error)

Disc Information (Disc Type = DVD Audio)

	First transfer (DC4)
Data 1	Total Group No.(MSB)
Data 2	Total Group No. (LSB)
Data 3	Group 1 Total Track No. (MSB)
Data 4	Group 1 Total Track No. (LSB)
Data 5	Group 2 Total Track No. (MSB)
Data 6	Group 2 Total Track No. (LSB)
Data 7	Group 3 Total Track No. (MSB)
Data 8	Group 3 Total Track No. (LSB)
Data 9	Group 4 Total Track No. (MSB)
Data 10	Group 4 Total Track No. (LSB)
Data 11	Group 5 Total Track No. (MSB)
Data 12	Group 5 Total Track No. (LSB)
Data 13	Group 6 Total Track No. (MSB)
Data 14	Group 6 Total Track No. (LSB)
Data 15	Group 7 Total Track No. (MSB)
Data 16	Group 7 Total Track No. (LSB)
Data 17	Group 8 Total Track No. (MSB)
Data 18	Group 8 Total Track No. (LSB)
Data 19	Group 9 Total Track No. (MSB)
Data 20	Group 9 Total Track No. (LSB)
Data 21	Reserved = '0'
	:
Data 250	Reserved = '0'

3. Get player information

Command	Report
1 DC4	1 DC4
2 SW = 4	2 SW = 4
3 Command length (MSB)	3 Command length (MSB)
4 Command length (LSB)	4 Command length (LSB)
5 Command code (MSB)	5 Command code (MSB)
6 Command code (LSB)	6 Command code (LSB)
7 Reserved = '0'	7 Return Code
8 :	8 No.1 Disc Type (MSB)
9 :	9 No.1 Disc Type (LSB)
10 :	10 No.2 Disc Type (MSB)
11 :	11 No.2 Disc Type (LSB)
12 :	12 No.3 Disc Type (MSB)
13 :	13 No.3 Disc Type (LSB)
14 :	14 No.4 Disc Type (MSB)
15 :	15 No.4 Disc Type (LSB)
16 :	16 No.5 Disc Type (MSB)
17 :	17 No.5 Disc Type (LSB)
18 :	18 Reserved = '0'
19 :	19 Reserved = '0'
20 Reserved = '0'	20 Sum (MSB)
21 Sum (MSB)	21 Sum (LSB)
22 Sum (LSB)	22 ETX
23 ETX	

Command Length = '10'

(16)

Command Code = '12'

Command Length = '0F'

(15)

Command Code = '12'

Disc Type : refer Disc Type bit in 'Get Status and disc information' command

4. Load & Seek

Command		Report	
1	DC4	1	DC4
2	SW = 4	2	SW = 4
3	Command length (MSB)	3	Command length (MSB)
4	Command length (LSB)	4	Command length (LSB)
5	Command code (MSB)	5	Command code (MSB)
6	Command code (LSB)	6	Command code (LSB)
7	Next State	7	Return Code
8	Seek Type	8	Sum (MSB)
9	Parameter1	9	Sum (LSB)
10	Parameter2	10	EXT
11	Parameter3		
12	Parameter4		
13	Parameter5		
14	Parameter6		
15	Parameter7		
16	Parameter8		
17	Parameter9		
18	Parameter10		
19	Parameter11		
20	Parameter12		
21	Sum (MSB)		
22	Sum (LSB)		
23	EXT		

Command Length = '10'
 (16)
 Command Code = '20'

Command Length = '03'
 (03)
 Command Code = '20'

Next State

0	Play
1	Pause
2	Reserved
3	Stop (Seek Parameter is ignore)

Seek Type

0	CD/VCD Track/Index seek
1	CD/VCD Time seek
2	Reserved
3	DVD Video Title / Chapter seek, DVD Audio Group/Track/Index seek
4	DVD Time seek
5	Reserved = '0'
6	Reserved = '0'
7	Reserved = '0'

Parameter 1-4 (Target Disc Number: Disc 1- Disc 5)

Parameter1	Target Disc No. (MSB)
Parameter2	Target Disc No.
Parameter3	Target Disc No.
Parameter4	Target Disc No. (LSB)

Parameter 5-12

CD/VCD Track/Index Seek		
Parameter5	Target Track (MSB)	
Parameter6	Target Track (LSB)	
Parameter7	Target Index (MSB)	
Parameter8	Target Index (LSB)	
Parameter9	Reserved = '0'	
Parameter10	Reserved = '0'	
Parameter11	Reserved = '0'	
Parameter12	Reserved = '0'	
CD/VCD Time Seek		
Parameter5	Reserved = '0'	
Parameter6	Reserved = '0'	
Parameter7	Target Min (MSB)	
Parameter8	Target Min (LSB)	
Parameter9	Target Sec (MSB)	
Parameter10	Target Sec (LSB)	
Parameter11	Target Frame (MSB)	
Parameter12	Target Frame (LSB)	
	DVD Video Title / Chapter seek	DVD Audio Group/Track seek
Parameter5	Target Title (MSB)	Reserved = '0'
Parameter6	Target Title (LSB)	Target Group (0 - 9)
Parameter7	Target Chapter (MSB)	Target Track (MSB)
Parameter8	Target Chapter (LSB)	Target Track (LSB)
Parameter9	Reserved = '0'	Reserved = '0'
Parameter10	Reserved = '0'	Reserved = '0'
Parameter11	Reserved = '0'	Reserved = '0'
Parameter12	Reserved = '0'	Reserved = '0'
DVD Time seek		
Parameter5	Target Hour (MSB)	
Parameter6	Target Hour (LSB)	
Parameter7	Target Min (MSB)	
Parameter8	Target Min (LSB)	
Parameter9	Target Sec (MSB)	
Parameter10	Target Sec (LSB)	
Parameter11	Reserved = '0'	
Parameter12	Reserved = '0'	

Communications

- [1] No connection of the AC Outlet of the DVD player / no connection of RS-232C cable

Because DVD Player can not send a configuration after the 5th re-sending of Ready, please let host report trouble.

DVD Player <---X----- HOST

- [2] AC outlet / RS-232C cable is plugged off after the communication has started

In this case, when host detected a data block timeout or 5th re-sending, please let host prohibit publishing any commands and clear send buffer. After that, re-start communication from sending Ready (start transactions) and check the [1].

However this cannot be detected when the report command is set to disable.

When the RS-232C cable is plugged off, though DVD Player try to send report commands for the operations by the remote controller or keys, the reports data are only stocked in the send buffer, which make it overflow.

When the send buffer overflowed, DVD Player clears the send buffer and stop sending report commands.

*In this case, DVD Player sends no report commands even after the RS-232C cable is re-connected.

Please plug off and on the AC outlet, or re-start communication from sending Ready (start transactions).

- [3] AC outlet is plugged in after [1],[2]

DVD Player report the configuration after the system is reset.

When the host receives the report, please let host send Ready to start communication.

- [4] Host turns on after the DVD Player turned on

After confirming existence of DVD Player by Configuration, control command can be sent to DVD Player.

However, DVD Player can accept only System command and power command when the power is Off, and can accept no report commands for other operations.

When communication errors (timeout etc.) occur during the start transactions, the same process as [1] is needed.

DVD Player		HOST	
	<-----	Ready	
Configuration	----->		] start transactions
	<-----	Set enable/disable report command	
	<-----	control command	
(report command	----->	) ; depends on the setting	

- [5] Error transactions after [4]

When host detect a timeout of report command or 5th re-sending of control command, please clear the send buffer and re-start from the start transactions.

Appendix

* ASCII Chart

	0	1	2	3	4	5	6	7
0	NUL	DLE	SP	0	@	P	`	p
1	SOH	DC1	!	1	A	Q	a	q
2	STX	DC2	"	2	B	R	b	r
3	ETX	DC3	#	3	C	S	c	s
4	EOT	DC4	\$	4	D	T	d	t
5	ENQ	NAK	%	5	E	U	e	u
6	ACK	SYN	&	6	F	V	f	v
7	BEL	ETB	'	7	G	W	g	w
8	BS	CAN	(	8	H	X	h	x
9	HT	EM	)	9	I	Y	i	y
A	LF	SUB	*	:	J	Z	j	z
B	VT	EXC	+	;	K	[	k	{
C	FF	FS	,	<	L	¥	l	|
D	CR	GS	-	=	M	]	m	}
E	SO	RS	.	>	N	^	n	~
F	SI	US	/	?	O	_	o	DEL

- * the column number = the first hexadecimal digit
the row number = the second hexadecimal digit

- * The characters in the gray sells are available in the RS-232C communications.