DENON AVR control protocol

Ver.01

Application model : AVR-2313CI/AVR-2313
Application terminal: Ethernet
RS-232C

Rev 8.4.0

Connector specification

Ⅰ. RS-232C

Connector type: DB-9pin female type, slave straight connection (DCE type)
(1pin : GND , 2pin : TxD , 3pin : RxD , 5pin : Common(GND) , 4,6,7,8,9pin : NC)

Communication format:

Synchronous system	: Tone step synchronization
Communication system	: A half duplex
Communication speed	: 9600bps
Character length	: 8 bits
Parity control	: None
Start bit	: 1 bit
Stop bit	: 1 bit
Communication procedure	: Non procedural
Communication data length	: 135 bytes (maximum)

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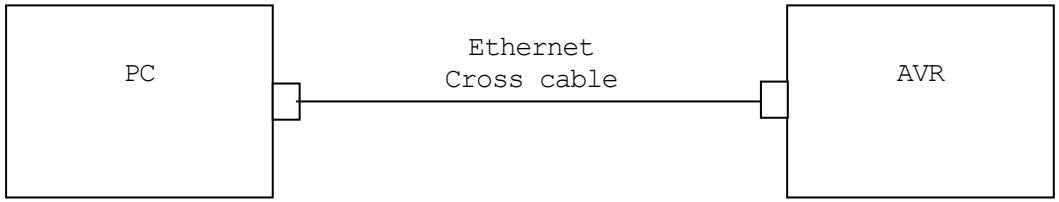
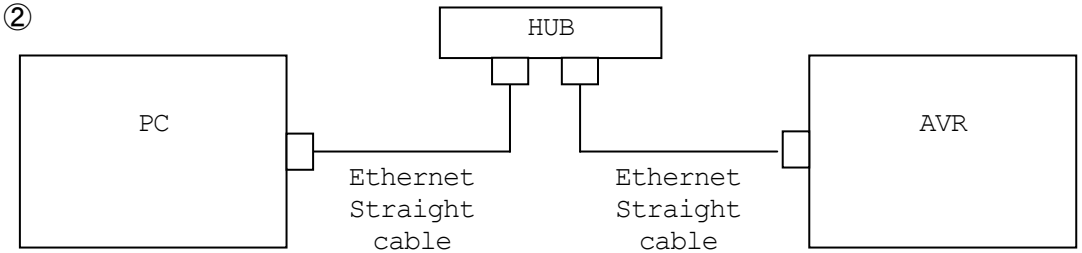
Ⅱ. Ethernet

Connector type : RJ-45(10BASE-T/100BASE-TX)

Example ①



Example ②



Communication format :

Communication system	: A half duplex
Communication speed	: 10Mbps/100Mbps
Communication port	: TCP port 23 (telnet)
Communication data length	: 135bytes (maximum)

NETWORK SETUP of AVR-2313CI/AVR-2313

>Procedure of Network Setup mode.

(1)Press SETUP MENU button, then Menu appears on FL-display(and GUI)

(2)Select “Setup Menu > Network > Settings ” .

(3)Set parameters described below.

<DHCP> "ON"---Use this setting when DHCP server is on the local network.
"OFF"---Use this setting when DHCP server is not on the local network.

<IP Address> When <DHCP> sets "OFF”, please set IP address.
When <DHCP> sets "ON”, you can confirm the IP address that is set by server.

<Subnet Mask> When <DHCP> sets "OFF”, please set Subnet Mask.
When <DHCP> sets "ON”, you can confirm the Subnet Mask that is set by server.

<Gateway> Set the address of Gateway when Gateway is on the local network.
Do not set this parameter when Gateway is not on the local network.

<Primary DNS> Do not set this parameter.

<Second DNS> Do not set this parameter.

<Proxy> Set this parameter "OFF".

<Network Option: IP Control>

(1)Press SETUP MENU button, then Menu appears on FL-display (and GUI)

(2)Select “Setup Menu > Network > IP Control”

(3)Set parameters described below.

“Always On”---Use this setting when using the AVR-2313CI/AVR-2313 Connected in a network.

“Off In Standby”--- Use this setting when not using the AVR-2313CI/AVR-2313 connected in a network.
This setting is reducing the power consumption in the standby mode.

Protocol specification

The following three data forms are defined.

COMMAND : The message sent to a system(AVR) from a controller(Touch Panel etc.)
A command to a system is given from a controller.

EVENT : The message sent to a controller (Touch Panel etc.) from a system (AVR)
The result is sent, when a system is operated directly and a state changes.
*The form of ***EVENT*** presupposes that it is the same as that of ***COMMAND***.
Refer to the following table for the contents of ***COMMAND* and ***EVENT***.

RESPONSE : The message sent to a controller (Touch Panel etc.) from a system (AVR)
if the 'request command' (***COMMAND***+***?***+CR(0x0D)) has came from a controller.
The ***RESPONSE*** should be sent within 200ms of receiving the ***COMMAND***.
*The form of ***RESPONSE*** presupposes that it is the same as that of ***EVENT***.

Basic specification: The command by ASCII CODE, parameter expression

*ASCII CODE which can be used is from 0x20 to 0x7F: the alphabet and the number of 0-9, and space (0x20), some signs, AND carriage return (0x0D) --- It is used only as a pause sign.

Command structure: COMMAND + PARAMETER + CR (0x0D)

COMMAND: ASCII CODE of 2 characters

Ex. SI : Select Input source
MS : surround Mode Setting
MV : Master Volume setting
PW : system PoWer setting

PARAMETER : ASCII CODE (up to 25 characters)

ex. DVD : function name

SUPER STADIUM : surround mode name

*Special Parameter--- ? : for request command

The example of a command * <CR> is the meaning of 0x0D.

SIDVD<CR> : Select Input source DVD

MSSTEREO<CR> : surround Mode Set to STEREO

MVUP<CR> : Master Volume UP

PWON<CR> : system PoWer ON

PWSTANDBY<CR> : system PoWer STANDBY

SI?<CR> : Request command for now playing input source >> Return ***RESPONSE*** 'SI***<CR>'

Others

A) ***COMMAND*** is receivable also during transmission of ***EVENT***.

B) Since CHANNEL VOLUME changes simultaneously when the SURROUND MODE changes, the value of the channel volume of all channels returns as ***EVENT***.

C) CHANNEL VOLUME returns the data of ALL channels by the present SURROUND MODE also including an intact channel. In this case, the data of an intact channel is set to "50".

D) Since SURROUND MODE changes simultaneously when the INPUT source changes, the SURROUND MODE (and also the value of the channel volume of all channels , It described in B)) returns as ***EVENT***.

E) When SURROUND MODE is the same in between INPUT source change before and after, ***EVENT*** of SURROUND MODE and CHANNEL VOLUME does NOT return.

F) Although ***EVENT*** of SURROUND MODE returns when the present SURROUND MODE is set up again, CHANNEL VOLUME does NOT return.

G) When SURROUND MODE is changed, before returning SURROUND MODE after change as ***EVENT***, the present SURROUND MODE is returned.

H) The ***RESPONSE*** should be sent as opposed to the request command by all the commands with which an ***EVENT*** exists , not need to the another request commands(ex. SV command).

I) The ***PARAMETER*** (with ***COMMAND*** and ***RESPONSE***, ***EVENT***) of minimum level of MASTER VOLUME defines “00”.

J) If the MASTER VOLUME & CHANNEL VOLUME set with 0.5dB step, the ***PARAMETER*** (with ***COMMAND*** and ***RESPONSE***, ***EVENT***) defines three ASCII characters as bellows.

Ex. MASTER VOLUME = +18.0dB : MV98<CR>
| |
+1.0dB : MV81<CR>
+0.5dB : MV805<CR>
0dB : MV80<CR>
-0.5dB : MV795<CR>
-1.0dB : MV79<CR>
| |
-79.5dB : MV005<CR>
--- : MV00<CR>

* At the **.0dB step, only uses two ASCII characters as ***PARAMETER***, same as usual.

K) **1 seconds** later, please transmit the next ***COMMAND*** after transmitting a power on ***COMMAND*** (PWON) .

COMMAND and PARAMETER list

COMMAND	***PARAMETER***	function	example
PW	ON	POWER ON/STANDBY change	PWON<CR>
	STANDBY		PWSTANDBY<CR>
	?	Return PW Status	PW?<CR>
MV	UP	MASTER VOLUME UP/DOWN , direct change to **(**dB)	MVUP<CR>
	DOWN		MVDOWN<CR>
	**	**:**00 to 98** by ASCII , 80=80(0dB), **00=-0(--dB)(MIN)**	MV80<CR>
	?	Return MV Status	MV?<CR>
CV	FL UP	CHANNEL VOLUME UP/DOWN , direct change to **dB	CVFL UP<CR>
	FL DOWN	---FRONT Lch	CVFL DOWN<CR>
	FL **	**:38 to 62 by ASCII , 50=0dB	CVFL 50<CR>
	FR UP		CVFR UP<CR>
	FR DOWN	---FRONT Rch	CVFR DOWN<CR>
	FR **	**:38 to 62 by ASCII , 50=0dB	CVFR 50<CR>
	C UP		CVC UP<CR>
	C DOWN	---CENTERch	CVC DOWN<CR>
	C **	**:38 to 62 by ASCII , 50=0dB	CVC 50<CR>
	SW UP		CVSW UP<CR>
	SW DOWN	---SUBWOOFERch	CVSW DOWN<CR>
	SW **	**:38 to 62 by ASCII , 50=0dB,00=OFF	CVSW 50<CR>
	SL UP		CVSL UP<CR>
	SL DOWN	---SURROUND Lch	CVSL DOWN<CR>
	SL **	**:38 to 62 by ASCII , 50=0dB	CVSL 50<CR>
	SR UP		CVSR UP<CR>
	SR DOWN	---SURROUND Rch	CVSR DOWN<CR>
	SR **	**:38 to 62 by ASCII , 50=0dB	CVSR 50<CR>
	SBL UP	---SURROUND BACK Lch (SBch 2SP)	CVSBL UP<CR>
	SBL DOWN		CVSBL DOWN<CR>
	SBL **	**:38 to 62 by ASCII , 50=0dB	CVSBL 50<CR>
	SBR UP	---SURROUND BACK Rch (SBch 2SP)	CVSBR UP<CR>
	SBR DOWN		CVSBR DOWN<CR>
	SBR **	**:38 to 62 by ASCII , 50=0dB	CVSBR 50<CR>

MV, CV ***COMMAND*** : "*" parameter uses two or three ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
CV	SB UP	---SURROUND BACKch (SBch 1SP)	CVSB UP<CR>
	SB DOWN		CVSB DOWN<CR>
	SB **	**:38 to 62 by ASCII , 50=0dB	CVSB 50<CR>
	FHL UP		CVFHL UP<CR>
	FHL DOWN	---FRONT HEIGHT Lch	CVFHL DOWN<CR>
	FHL **	**:38 to 62 by ASCII , 50=0dB	CVFHL 50<CR>
	FHR UP		CVFHR UP<CR>
	FHR DOWN	---FRONT HEIGHT Rch	CVFHR DOWN<CR>
	FHR **	**:38 to 62 by ASCII , 50=0dB	CVFHR 50<CR>
	FWL UP		CVFWL UP<CR>
	FWL DOWN	---FRONT WIDE Lch	CVFWL DOWN<CR>
	FWL **	**:38 to 62 by ASCII , 50=0dB	CVFWL 50<CR>
	FWR UP		CVFWR UP<CR>
	FWR DOWN	---FRONT WIDE Rch	CVFWR DOWN<CR>
	FWR **	**:38 to 62 by ASCII , 50=0dB	CVFWR 50<CR>
	?	Return CV Status	CV?<CR>
MU	ON	VOLUME MUTE ON/OFF change	MUON<CR>
	OFF		MUOFF<CR>
	?	Return MU Status	MU?<CR>
SI	CD	Select INPUT source	SICD<CR>
	TUNER	---FM TUNER	SITUNER<CR>
	DVD		SIDVD<CR>
	BD	---Blu-ray	SIBD<CR>
	TV	---TV AUDIO	SITV<CR>
	SAT/CBL	---CBL/SAT	SISAT/CBL<CR>
	MPLAY	---MEDIA PLAYER	**SISMPLAY <CR>**
	GAME		SIGAME<CR>
	AUX1	---AUX	**SIAUX1<CR>**

CV ***COMMAND*** : "*" parameter uses two or three ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
SI	NET	---NETWORK	SINET<CR>
	PANDORA	(North America model Only)	SIPANDORA<CR>
	SIRIUSXM	(North America model Only)	**SISIRIUSXM<CR>**
	LASTFM	(Europe model Only)	SILASTFM<CR>
	FLICKR		SIFLICKR<CR>
	FAVORITES		SIFAVORITES<CR>
	IRADIO		SIIRADIO<CR>
	SERVER		SISERVER<CR>
	USB/IPOD	Select iPod/USB	SIUSB/IPOD<CR>
	USB	Select INPUT source iPod/USB and USB Start Playback	SIUSB<CR>
	IPD	Select INPUT source iPod/USB and iPod Direct Start Playback	SIIPD<CR>
	IRP	Select INPUT source NETWORK and Internet Radio Start Playback	SIIRP<CR>
	FVP	Select INPUT source NETWORK and Favorites Start Playback	SIFVP<CR>
	?	Return SI Status	SI?<CR>
ZM	ON	MAIN ZONE ON/OFF change	ZMON<CR>
	OFF		ZMOFF<CR>
	?	Return ZM Status	ZM?<CR>
	FAVORITE1	FAVORITE STATION 1-3 MODE SELECT	**ZMFAVORITE1<CR>**
	FAVORITE2		**ZMFAVORITE2<CR>**
	FAVORITE3		**ZMFAVORITE3<CR>**
	FAVORITE1 MEMORY	FAVORITE STATION 1-3 MODE MEMORY	**ZMFAVORITE1 MEMORY<CR>**
	FAVORITE2 MEMORY		**ZMFAVORITE2 MEMORY<CR>**
	FAVORITE3 MEMORY		**ZMFAVORITE3 MEMORY<CR>**
SR	**CD**	REC SELECT mode set , and select source	**SRCD<CR>**
	|	---The name of PARAMETER is	**|**
	USB/IPOD	the same as that of the time of SI COMMAND.	**SRUSB/IPOD<CR>**
	SOURCE	REC SELECT mode cancel	**SRSOURCE<CR>**
	?	Return SR Status	**SR?<CR>**

COMMAND	***PARAMETER***	function	example
SD	AUTO	set AUTO mode (Priority:HDMI>>DIGITAL>>ANALOG)	SDAUTO<CR>
	HDMI	set force HDMI INPUT mode	SDHDMI<CR>
	DIGITAL	set force DIGITAL INPUT (Optical,Coaxial)mode	SDDIGITAL<CR>
	ANALOG	set force ANALOG INPUT mode	SDANALOG<CR>
	?	Return SD Status	SD?<CR>
DC	AUTO	set DIGITAL INPUT AUTO mode	DCAUTO<CR>
	PCM	set DIGITAL INPUT force PCM mode	DCPCM<CR>
	DTS	set DIGITAL INPUT force DTS mode	DCDTS<CR>
	?	Return DC Status	DC?<CR>
SV	DVD	VIDEO SELECT mode set , and select source	SVDVD<CR>
	BD	---Blu-ray	SVBD<CR>
	TV	---TV AUDIO	SVTV<CR>
	SAT/CBL	---CBL/SAT	SVSAT/CBL<CR>
	MPLAY	---MediaPlayer	**SVMPLAY<CR>**
	GAME	---GAME	SVGAME<CR>
	AUX1	---AUX	**SVAUX1<CR>**
	CD		**SVCD<CR>**
	SOURCE	VIDEO SELECT mode cancel	SVSOURCE<CR>
	?	Return SV Status	SV?<CR>
SLP	OFF	MAIN ZONE SLEEP TIMER setting	SLPOFF<CR>
	***	***:001 to 120 by ASCII , 010=10min	SLP120<CR>
	?	Return SLP Status	SLP?<CR>

COMMAND	*PARAMETER*	function	example
MS	MOVIE	Select SURROUND mode	MSMOVIE<CR>
	MUSIC		MSMUSIC<CR>
	GAME		MSGAME<CR>
	DIRECT		MSDIRECT<CR>
	PURE DIRECT		MSPURE DIRECT<CR>
	STEREO		MSSTEREO<CR>
	STANDARD		MSSTANDARD<CR>
	DOLBY DIGITAL		MSDOLBY DIGITAL<CR>
	DTS SUROUND		MSDTS SURROUND<CR>
	MCH STEREO	---MULTI CH STEREO mode	MSMCH STEREO<CR>
	ROCK ARENA		MSROCK ARENA<CR>
	JAZZ CLUB		MSJAZZ CLUB<CR>
	MONO MOVIE		MSMONO MOVIE<CR>
	MATRIX		MSMATRIX<CR>
	VIDEO GAME		MSVIDEO GAME<CR>
	VIRTUAL		MSVIRTUAL<CR>
	?	Return MS Status	MS?<CR>
	QUICK1	QUICK SELECT 1-5 MODE SELECT	MSQUICK1<CR>
	QUICK2		MSQUICK2<CR>
	QUICK3		MSQUICK3<CR>
	QUICK4		MSQUICK4<CR>
	QUICK5		MSQUICK5<CR>
	QUICK1 MEMORY	QUICK SELECT 1-5 MODE MEMORY	MSQUICK1 MEMORY<CR>
	QUICK2 MEMORY		MSQUICK2 MEMORY<CR>
	QUICK3 MEMORY		MSQUICK3 MEMORY<CR>
	QUICK4 MEMORY		MSQUICK4 MEMORY<CR>
	QUICK5 MEMORY		MSQUICK5 MEMORY<CR>
	QUICK ?	Return MSQUICK Status	MSQUICK ?<CR>

COMMAND	*PARAMETER*	function	example
VS	**ASPNRM**	Set Aspect Ratio to 4:3 mode	**VSASPNRM<CR>**
	ASPFUL	Set Aspect Ratio to 16:9 mode	**VSASPFUL<CR>**
	ASP ?	Return VSASP Status	**VSASP ?<CR>**
	MONIAUTO	**Set HDMI MONITOR automatic detection**	**VSMONIAUTO<CR>**
	MONI1	Set HDMI MONITOR OUT-1	VSMONI1<CR>
	MONI2	Set HDMI MONITOR OUT-2	VSMONI2<CR>
	MONI ?	Return VSMONI Status	VSMONI ?<CR>
	SC48P	Set Resolution to 480p/576p	**VSSC48P<CR>**
	SC10I	Set Resolution to 1080i	**VSSC10I<CR>**
	SC72P	Set Resolution to 720p	**VSSC72P<CR>**
	SC10P	Set Resolution to 1080p	**VSSC10P<CR>**
	SC10P24	Set Resolution to 10P24	**VSSC10P24<CR>**
	SC4K	Set Resolution to 4K	**VSSC4K<CR>**
	SCAUTO	Set Resolution to AUTO	**VSSCAUTO<CR>**
	SC ?	Return VSSC Status	**VSSC ?<CR>**
	SCH48P	Set Resolution to 480p/576p (HDMI)	**VSSCH48P<CR>**
	SCH10I	Set Resolution to 1080i(HDMI)	**VSSCH10I<CR>**
	SCH72P	Set Resolution to 720p(HDMI)	**VSSCH72P<CR>**
	SCH10P	Set Resolution to 1080p(HDMI)	**VSSCH10P<CR>**
	SCH10P24	Set Resolution to 10P24(HDMI)	**VSSCH10P24<CR>**
	SCH4K	Set Resolution to 4K (HDMI)	**VSSCH4K<CR>**
	SCHAUTO	Set Resolution to AUTO(HDMI)	**VSSCHAUTO<CR>**
	SCH ?	Return VSSCH Status(HDMI)	**VSSCH ?<CR>**
	AUDIO AMP	Set HDMI AUDIO Output to AMP	VSAUDIO AMP<CR>
	AUDIO TV	Set HDMI AUDIO Output to TV	VSAUDIO TV<CR>
	AUDIO ?	Return VSAUDIO Status	VSAUDIO ?<CR>
	VPMAUTO	Set Video Processing Mode to AUTO	VSVPMAUTO<CR>
	VPMGAME	Set Video Processing Mode to GAME	VSVPMGAME<CR>
	VPMMOVI	Set Video Processing Mode to MOVIE	VSVPMMOVI<CR>
	VPM ?	Return VSVPM Status	VSVPM ?<CR>

COMMAND	*PARAMETER*	function	example
PS	TONE CTRL OFF	PARAMETER setting	PSTONE CTRL OFF<CR>
	TONE CTRL ON	TONE CONTROL ON/OFF	PSTONE CTRL OFF<CR>
	TONE CTRL ?	Return PSTONE CONTROL Status	PSTONE CTRL ?<CR>
	SB:MTRX ON	SURROUND BACK SP MODE set	PSSB:MTRX ON<CR>
	SB:PL2x CINEMA		PSSB:PL2X CINEMA<CR>
	SB:PL2x MUSIC		PSSB:PL2X MUSIC<CR>
	SB:ON		PSSB:ON<CR>
	SB:OFF		PSSB:OFF<CR>
	SB: ?	Return PSSB: Status	PSSB: ?<CR>
	CINEMA EQ.ON	CINEMA EQ. ON/OFF	PSCINEMA EQ.ON<CR>
	CINEMA EQ.OFF		PSCINEMA EQ.OFF<CR>
	CINEMA EQ. ?	Return PSCINEMA EQ.Status	PSCINEMA EQ. ?<CR>
	MODE:MUSIC	CINEMA / MUSIC / GAME / PL mode change	PSMODE:MUSIC<CR>
	MODE:CINEMA	(This parameter can change DOLBY PL2,PL2x,NEO:6 mode.)	PSMODE:CINEMA<CR>
	MODE:GAME	---SB=ON : PL2x mode / SB=OFF : PL2 mode	PSMODE:GAME<CR>
	MODE:PRO LOGIC	--- GAME can change DOLBY PL2 & PL2x mode --- PL can change ONLY DOLBY PL2 mode	PSMODE:PRO LOGIC<CR>
	MODE: ?	Return PSMODE: Status	PSMODE: ?<CR>
	LOM ON	Loudness Management ON/OFF Control	**PSLOM ON<CR>**
	LOM OFF		**PSLOM OFF<CR>**
	LOM ?	Return PSLOM: Status	**PSLOM ? <CR>**
	FH:ON	FRONT HEIGHT ON/OFF	PSFH:ON<CR>
	FH:OFF		PSFH:OFF<CR>
	FH: ?	Return PSFH: Status	PSFH: ?<CR>
	PHG LOW	PLⅡz HEIGHT GAIN direct change	PSPHG LOW<CR>
	PHG MID		PSPHG MID<CR>
	PHG HI		PSPHG HI<CR>
	PHG ?	Return PSPHG Status	PSPHG ?<CR>

COMMAND	***PARAMETER***	function	example
PS	MULTEQ:AUDYSSEY	MultEQ XT/MultEQ mode direct change	PSMULTEQ:AUDYSSEY<CR>
	MULTEQ:BYP.LR		PSMULTEQ:BYP.LR<CR>
	MULTEQ:FLAT		PSMULTEQ:FLAT<CR>
	MULTEQ:MANUAL		PSMULTEQ:MANUAL<CR>
	MULTEQ:OFF		PSMULTEQ:OFF<CR>
	MULTEQ: ?	Return PSMULTEQ: Status	PSMULTEQ: ?<CR>
	DYNEQ ON	Dynamic EQ = ON	PSDYNEQ ON<CR>
	DYNEQ OFF	Dynamic EQ = OFF	PSDYNEQ OFF<CR>
	DYNEQ ?	Return PSDYNEQ Status	PSDYNEQ ?<CR>
	REFLEV 0	Reference Level Offset=0dB	PSREFLEV 0<CR>
	REFLEV 5	Reference Level Offset=5dB	PSREFLEV 5<CR>
	REFLEV 10	Reference Level Offset=10dB	PSREFLEV 10<CR>
	REFLEV 15	Reference Level Offset=15dB	PSREFLEV 15<CR>
	REFREV ?	Return PSREFLEV Status	PSREFLEV ?<CR>
	DYNVOL HEV	Dynamic Volume = Heavy	**PSDYNVOL HEV<CR>**
	DYNVOL MED	Dynamic Volume = Medium	**PSDYNVOL MED<CR>**
	DYNVOL LIT	Dynamic Volume = Light	**PSDYNVOL LIT<CR>**
	DYNVOL OFF	Dynamic Volume = OFF	**PSDYNVOL OFF<CR>**
	DYNVOL ?	Return PSDYNVOL Status	PSDYNVOL ?<CR>
	DSX ONH	Audyssey DSX ON(Height)	PSDSX ONH<CR>
	DSX ONW	Audyssey DSX ON(Wide)	PSDSX ONW<CR>
	DSX OFF	Audyssey DSX OFF	PSDSX OFF<CR>
	DSX ?	Return PSDSX Status	PSDSX ?<CR>
	STW UP	STAGE WIDTH UP/DOWN , direct change to **dB	PSSTW UP<CR>
	STW DOWN	**:00 to 99 by ASCII , 50=0dB	PSSTW DOWN<CR>
	STW **	---AVR-2313 can be operated from -10 to +10(40 to 60)	PSSTW 50<CR>
	STW ?	Return PSSTW Status	PSSTW ?<CR>
	STH UP	STAGE HEIGHT UP/DOWN , direct change to **dB	PSSTH UP<CR>
	STH DOWN	**:00 to 99 by ASCII , 50=0dB	PSSTH DOWN<CR>
	STH **	---AVR-2313 can be operated from -10 to +10(40 to 60)	PSSTH 50<CR>
	STH ?	Return PSSTH Status	PSSTH ?<CR>

COMMAND	***PARAMETER***	function	example
PS	BAS UP	BASS UP/DOWN , direct change to **dB	PSBAS UP<CR>
	BAS DOWN	**:00 to 99 by ASCII , 50=0dB	PSBAS DOWN<CR>
	BAS **	---AVR-2313 can be operated from -6 to +6(44 to 56)	PSBAS 50<CR>
	BAS ?	Return PSBAS Status	PSBAS ?<CR>
	TRE UP	TREBLE UP/DOWN , direct change to **dB	PSTRE UP<CR>
	TRE DOWN	**:00 to 99 by ASCII , 50=0dB	PSTRE DOWN<CR>
	TRE **	---AVR-2313 can be operated from -6 to +6(44 to 56)	PSTRE 50<CR>
	TRE ?	Return PSTRE Status	PSTRE ?<CR>
	DRC AUTO	Dynamic Compression direct change	PSDRC AUTO<CR>
	DRC LOW		PSDRC LOW<CR>
	DRC MID		PSDRC MID<CR>
	DRC HI		PSDRC HI<CR>
	DRC OFF		PSDRC OFF<CR>
	DRC ?		PSDRC ?<CR>
	LFE UP	LFE UP/DOWN , direct change to **dB	PSLEE UP<CR>
	LFE DOWN	**:00 to 99 by ASCII , 00=0dB, 10=-10dB	PSLFE DOWN<CR>
	LFE **	---AVR-2313 can be operated from 0 to -10	PSLFE 10<CR>
	LFE ?	Return PSLFE Status	PSLFE ? <CR>
	EFF UP	EFFECT UP/DOWN , EFFECT LEVEL direct change to **dB	PSEFF UP<CR>
	EFF DOWN	**:00 to 99 by ASCII , 00=0dB, 10=10dB	PSEFF DOWN<CR>
	EFF **	---AVR-2313 can be operated from 1 to 15	PSEFF 10<CR>
	EFF ?	Return PSEFF Status	PSEFF ?<CR>
	DEL UP	DELAY UP/DOWN , direct change to ***dB	PSDEL UP<CR>
	DEL DOWN	***:000 to 999 by ASCII , 000=0ms, 300=300ms	PSDEL DOWN<CR>
	DEL ***	---AVR-2313 can be operated from 0 to 300	PSDEL ***<CR>
	DEL ?	Return PSDEL Status	PSDEL ?<CR>

PS ***COMMAND*** : "*" parameter uses two or three ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
PS	PAN ON	PANORAMA ON/OFF	PSPAN ON<CR>
	PAN OFF		PSPAN OFF<CR>
	PAN ?	Return PSPAN Status	PSPAN ?<CR>
	DIM UP	DIMENSION UP/DOWN , direct change to **dB	PSDIM UP<CR>
	DIM DOWN	**:00 to 99 by ASCII , 00=0,	PSDIM DOWN<CR>
	DIM **	--- AVR-2313 can be operated from 0 to 6	PSDIM **<CR>
	DIM ?	Return PSDIM Status	PSDIM ?<CR>
	CEN UP	CENTER WIDTH UP/DOWN , direct change to **dB	PSCEN UP<CR>
	CEN DOWN	**:00 to 99 by ASCII , 00=0	PSCEN DOWN<CR>
	CEN **	--- AVR-2313 can be operated from 0 to 7	PSCEN 07<CR>
	CEN ?	Return PSCEN Status	PSCEN ?<CR>
	CEI UP	CENTER IMAGE UP/DOWN , direct change to **dB	PSCEI UP<CR>
	CEI DOWN	**:00 to 99 by ASCII , 00=0.0	PSCEI DOWN<CR>
	CEI **	--- AVR-2313 can be operated from 0.0 to 1.0	PSCEI 10<CR>
	CEI?	Return PSCEI Status	OSCEI ?<CR>
	SWR ON	SW ON/OFF	PSSWR ON<CR>
	SWR OFF		PSSWR OFF<CR>
	SWR ?	Return PSSWR Status	PSSWR ?<CR>
	RSZ S	ROOM SIZE direct change	PSRSZ S<CR>
	RSZ MS		PSRSZ MS<CR>
	RSZ M		PSRSZ M<CR>
	RSZ ML		PSRSZ ML<CR>
	RSZ L		PSRSZ L<CR>
	RSZ ?	Return PSRSZ Status	PSRSZ ?<CR>
	DELAY UP	AUDIO DELAY UP/DOWN , direct change to ***dB	PSDELAY UP<CR>
	DELAY DOWN	***:000 to 999 by ASCII , 000=0ms, 200=200ms	PSDELAY DOWN<CR>
	DELAY ***	--- AVR-2313 can be operated from 0 to 200	PSDELAY 200<CR>
	DELAY ?	Return PSDELAY Status	PSDELAY ?<CR>

PS ***COMMAND*** : "*" parameter uses two or three ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
PS	RSTR OFF	AUDIO RESTORER direct change	PSRSTR OFF<CR>
	RSTR MODE1		PSRSTR MODE1<CR>
	RSTR MODE2		PSRSTR MODE2<CR>
	RSTR MODE3		PSRSTR MODE3<CR>
	RSTR ?	Return PSRSTR Status	PSRSTR ?<CR>
	FRONT SPA	FRONT SPEAKER direct change	PSFRONT SPA<CR>
	FRONT SPB		PSFRONT SPB<CR>
	FRONT SPA+B		PSFRONT A+B<CR>
	FRONT?	Return PSFRONT Status	PSFRONT?<CR>

COMMAND	***PARAMETER***	function	example
PV	CN UP	CONTRAST UP/DOWN , direct change to **dB	PVCN UP<CR>
	CN DOWN	**:44 to 56 by ASCII , 50=0	PVCN DOWN<CR>
	CN **	--- AVR-2313 can be operated from -6 to +6(44 to 56)	PVCN 50<CR>
	CN ?	Return PSCN Status	PVCN ?<CR>
	BR UP	BRIGHTNESS UP/DOWN , direct change to **dB	PVBR UP<CR>
	BR DOWN	**:00 to 12 by ASCII , 00=0	PVBR DOWN<CR>
	BR **	--- AVR-2313 can be operated from 0 to 12	PVBR 12<CR>
	BR ?	Return PSBR Status	PVBR ?<CR>
	CM UP	CHROMA LEVEL UP/DOWN , direct change to **dB	PVCM UP<CR>
	CM DOWN	**:44 to 56 by ASCII , 50=0	PVCM DOWN<CR>
	CM **	--- AVR-2313 can be operated from -6 to +6(44 to 56)	PVCM 50<CR>
	CM ?	Return PSCN Status	PVCM ?<CR>
	HUE UP	HUE UP/DOWN , direct change to **dB	PVHUE UP<CR>
	HUE DOWN	**:44 to 56 by ASCII , 50=0	PVHUE DOWN<CR>
	HUE **	--- AVR-2313 can be operated from -6 to +6(44 to 56)	PVHUE 50<CR>
	HUE ?	Return PSCN Status	PVHUE ?<CR>
	DNR OFF	DNR direct change	PVDNR OFF<CR>
	DNR LOW		PVDNR LOW<CR>
	DNR MID		PVDNR MID<CR>
	DNR HI		PVDNR HI<CR>
	DNR ?	Return PVDNR Status	PVDNR ?<CR>
	ENH UP	ENHANCER UP/DOWN, direct change to **dB	PVENH UP<CR>
	ENH DOWN	**:00 to 12 by ASCII, 00=0	PVENH DOWN<CR>
	ENH **	--- AVR-2313 can be operated from 0 to 12	PVENH 12<CR>
	ENH ?	Return PVENH Status	PVENH ?<CR>

PV ***COMMAND*** : "*" parameter uses two ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
Z2	PHONO | USB/IPOD	ZONE2 mode set , and select source ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z2PHONO<CR> | Z2USB/IPOD<CR>
	USB	Select ZONE2 source iPod/USB and USB Start Playback	Z2USB<CR>
	IPD	Select ZONE2 source iPod/USB and iPod Direct Start Playback	Z2IPD<CR>
	IRP	Select ZONE2 source NETWORK and Internet Radio Start Playback	**Z2IRP<CR>**
	FVP	Select ZONE2 source NETWORK and Favorites Start Playback	**Z2FVP<CR>**
	SOURCE	ZONE2 mode cancel	Z2SOURCE<CR>
	UP	ZONE2 VOLUME UP/DOWN , direct change to **dB	Z2UP<CR>
	DOWN		Z2DOWN<CR>
	**	**:00 to 98** by ASCII , 80=80(0dB), **00=-0(--dB)(MIN)**	Z280<CR>
	ON	ZONE2 ON/OFF change	Z2ON<CR>
	OFF		Z2OFF<CR>
	?	Return Z2 Status	Z2?<CR>
Z2MU	ON	ZONE2 OUTPUT MUTE ON/OFF change	Z2MUON<CR>
	OFF		Z2MUOFF<CR>
	?	Return Z2MU Status	Z2MU?<CR>
Z2CS	ST	ZONE2 Channel setting	Z2CSST<CR>
	MONO		Z2CSMONO<CR>
	?	Return Z2CS Status	Z2CS?<CR>
Z2CV	FL UP	ZONE2 CHANNEL VOLUME UP/DOWN , direct change to **dB	Z2CVFL UP<CR>
	FL DOWN	---FRONT Lch	Z2CVFL DOWN<CR>
	FL **	**:38 to 62 by ASCII , 50=0dB	Z2CVFL 50<CR>
	FR UP	ZONE2 CHANNEL VOLUME UP/DOWN , direct change to **dB	Z2CVFR UP<CR>
	FR DOWN	---FRONT Rch	Z2CVFR DOWN<CR>
	FR **	**:38 to 62 by ASCII , 50=0dB	Z2CVFR 50<CR>
	?	Return Z2CV Status	Z2CV?<CR>
Z2HPF	ON	ZONE2 HPF ON/OFF	Z2HPFON<CR>
	OFF		Z2HPFOFF<CR>
	?	Return Z2HPF Status	Z2HPF?<CR>

Z2、Z2CV ***COMMAND*** : "*" parameter uses two ASCII characters. (see page6 J) section)

COMMAND	***PARAMETER***	function	example
Z2PS	BAS UP	ZONE2 BASS UP/DOWN , direct change to **dB	Z2PSBAS UP<CR>
	BAS DOWN	**:00 to 99 by ASCII , 00=0dB	Z2PSBAS DOWN<CR>
	BAS **	---AVR-2313 can be operated from -10 to +10(40 to 60)	Z2PSBAS 50<CR>
	BAS ?	Return Z2PSBAS Status	Z2PSBAS ?<CR>
	TRE UP	ZONE2 TREBLE UP/DOWN , direct change to **dB	Z2PSTRE UP<CR>
	TRE DOWN	**:00 to 99 by ASCII , 00=0dB	Z2PSTRE DOWN<CR>
	TRE **	---AVR-2313 can be operated from -10 to +10(40 to 60)	Z2PSTRE 50<CR>
	TRE ?	Return Z2PSTRE Status	Z2PSTRE ?<CR>
Z2SLP	OFF	ZONE2 SLEEP TIMER setting	Z2SLPOFF<CR>
	***	***:001 to 120 by ASCII , 010=10min	Z2SLP120<CR>
	?	Return SLP Status	Z2SLP?<CR>
Z2	**FAVORITE1**	ZONE2 FAVORITE STATION 1-3 MODE SELECT	**Z2FAVORITE1<CR>**
	FAVORITE2		**Z2FAVORITE2<CR>**
	FAVORITE3		**Z2FAVORITE3<CR>**
	FAVORITE1 MEMORY	ZONE2 FAVORITE STATION 1-3 MODE MEMORY	**Z2FAVORITE1 MEMORY<CR>**
	FAVORITE2 MEMORY		**Z2FAVORITE2 MEMORY<CR>**
	FAVORITE3 MEMORY		**Z2FAVORITE3 MEMORY<CR>**
	QUICK1	ZONE2 QUICK SELECT 1-5 MODE SELECT	Z2QUICK1<CR>
	QUICK2		Z2QUICK2<CR>
	QUICK3		Z2QUICK3<CR>
	QUICK4		Z2QUICK4<CR>
	QUICK5		Z2QUICK5<CR>
	QUICK1 MEMORY	ZONE2 QUICK SELECT 1-5 MODE MEMORY	Z2QUICK1 MEMORY<CR>
	QUICK2 MEMORY		Z2QUICK2 MEMORY<CR>
	QUICK3 MEMORY		Z2QUICK3 MEMORY<CR>
	QUICK4 MEMORY		Z2QUICK4 MEMORY<CR>
	QUICK5 MEMORY		Z2QUICK5 MEMORY<CR>
	QUICK ?	Return Z2QUICK Status	Z2QUICK ?<CR>

Z2PS ***COMMAND*** : "*" parameter uses two ASCII characters. (see page6 J) section)

※ ANALOG TUNER(FM) Control

COMMAND	***PARAMETER***	function	example
TF	ANUP	TUNER Frequency UP/DOWN	TFANUP<CR>
	ANDOWN		TFANDOWN<CR>
	AN****** (6 digits)	--- ****.** MHz at FM band (<050000 is FM.)	TFAN008750<CR> (87.50MHz at FM)
	AN?	Return TF Status	TFAN?<CR>
TP	ANUP	TUNER PRESET CH UP/DOWN , direct change to No.**	TPANUP<CR>
	ANDOWN	****:A1-G8(CH1-56)**	TPANDOWN<CR>
	AN** (PRESET No.)	**A5=CH5, B2=CH10, C4=CH20**	TPANA1<CR> (PRESET No.”01”)
	AN?	Return TP Status	TPAN?<CR>
	ANMEM	TUNER PRESET MEMORY	TPANMEM<CR>
	ANMEM**	TUNER PRESET MEMORY, Preset stored at No.** **:A1-G8**(CH1-56), A5=CH5, B2=CH10, C4=CH20**	TPANMEM**<CR>
TM	AN?	Return TM Status	TMAN?<CR>
	ANAUTO	---Tuning mode set to AUTO mode	TMANAUTO<CR>
	ANMANUAL	---Tuning mode set to MANUAL mode	TMANMANUAL<CR>

TF, TP, TM ***COMMAND*** : '*' parameters can NOT operate when INPUT source isn’t TUNER(FM).

※Network Audio/USB /iPod DIRECT Extended Control

COMMAND	*PARAMETER*	function	example
NS	90	"Cursor Up" Control	NS90<CR>
	91	"Cursor Down" Control	NS91<CR>
	92	"Cursor Left" Control	NS92<CR>
	93	"Cursor Right" Control	NS93<CR>
	94	"Enter (Play/Pause)" Control	NS94<CR>
	9A	"Play" Control(iRadio/mServer/USB) "Play/Pause" Control(iPod Direct)	NS9A<CR>
	9B	"Pause" Control "Play/Pause" Control(iPod Direct)	NS9B<CR>
	9C	"Stop" Control	NS9C<CR>
	9D	"Skip Plus" Control	NS9D<CR>
	9E	"Skip Minus" Control	NS9E<CR>
	9H	"Repeat One" (USB/iPod DIRECT/mServer)	NS9H<CR>
	9I	"Repeat All" (USB/iPod DIRECT/mServer)	NS9I<CR>
	9J	"Repeat Off" (USB/iPod DIRECT/mServer)	NS9J<CR>
	9K	"Random On/Repeat ALL" (USB/mServer) "Shuffle Songs" Control (iPod Direct Only)	NS9K<CR>
	9M	"Random Off" (USB/mServer) "Shuffle Off" Control (iPod Direct Only)	NS9M<CR>
	9W	Toggle Switch "Browse Mode/Remote Mode" Control (iPod Direct Only)	NS9W<CR>
	9X	"Page Next" Control	NS9X<CR>
	9Y	"Page Previous" Control	NS9Y<CR>
	PT	Enter/Exit PARTY MODE	NSPT<CR>
NSA		Return Onscreen Display Information List (ASCII CODE Character)	NSA<CR> (Return NSA0-NSA8,Refer to Page 37)
NSE		Request Onscreen Display Information List (UTF-8 CODE Character)	NSE<CR> (Return NSE0-NSE8,Refer to Page 38)
NSD	*	"Direct Text Search"(iRadio/mServer/USB only)	NSD0<CR> (*:0-9,A-Z)

COMMAND	*PARAMETER*	function	example
	B **(PRESET No.)**	**Preset Call** **** : 00-55 00=CH01,55=CH56**	**NSB00<CR>**
	C **(PRESET No.)**	**Preset Memory**, Preset stored at No.** **** : 00-55 00=CH01,55=CH56**	**NSC00<CR>**
	H	**Return Preset Channel 01-56 status (UTF-8)**	**NSH<CR>**

※Cursor/Enter/Setup Menu

COMMAND	***PARAMETER***	function	example
MN	CUP	"Cursor Up" Control	MNCUP<CR>
	CDN	"Cursor Down" Control	MNCDN<CR>
	CLT	"Cursor Left" Control	MNCLT<CR>
	CRT	"Cursor Right" Control	MNCRT<CR>
	ENT	"Enter" Control	MNENT<CR>
	RTN	"RETURN" Control	MNRTN<CR>
	OPT	"OPTION" Control	**MNOPT<CR>**
	INF	"INFO" Control	**MNINF<CR>**
	MEN ON	"Setup Menu ON" Control	MNMEN ON<CR>
	MEN OFF	"Setup Menu OFF" Control	MNMEN OFF<CR>

※TRIGGER CONTROL

COMMAND	***PARAMETER***	function	example
TR	**1 ON**	Trigger 1 ON/OFF Control	**TR1 ON<CR>**
	1 OFF		**TR1 OFF<CR>**

※Remote Lock/Panel Lock

COMMAND	***PARAMETER***	function	example
SY	REMOTE LOCK ON	REMOTE CONTROL LOCK ON/OFF	SYREMOTE LOCK ON<CR>
	REMOTE LOCK OFF		SYREMOTE LOCK OFF<CR>
	PANEL LOCK ON	PANEL BUTTON (Except MASTER VOL.)CONTROL LOCK ON	SYPANEL LOCK ON<CR>
	PANEL+V LOCK ON	PANEL BUTTON & MASTER VOL. CONTROL LOCK ON	SYPANEL+V LOCK ON<CR>
	PANEL LOCK OFF	PANEL BUTTUM & MASTER VOL. CONTROL LOCK OFF	SYPANEL LOCK OFF<CR>

※UPGRADE ID Display

COMMAND	***PARAMETER***	function	example
UG	IDN	ID Number for UPGRADE is displayed on FL Display	UGIDN<CR>

EVENT(or RESPONSE) and PARAMETER list

EVENT	***PARAMETER***	function	example
PW	ON	POWER ON/STANDBY change	PWON<CR>
	STANDBY		PWSTANDBY<CR>
MV	**	MASTER VOLUME change , **:00 to 98 by ASCII 98 = 18dB(MAX) 80 = 00dB 01 = -79dB 005 = -79.5dB 00 = ---(MIN)	MV80<CR>
CV	FL **	CHANNEL VOLUME change , **:00,38 to 62 by ASCII 62 = +12dB(MAX) 50 = 0dB 38 = -12dB(MIN) 00 = OFF (define ONLY SWch in DIRECT mode.)	CVFL 50<CR>
	FR **		CVFR 50<CR>
	C **		CVC 50<CR>
	SW **		CVSW 50<CR>
	SL **		CVSL 50<CR>
	SR **		CVSR 50<CR>
	SBL **	(at SBch 2SP)	CVSBL 50<CR>
	SBR **	(at SBch 2SP)	CVSBR 50<CR>
	SB **	(at SBch 1SP)	CVSB 50<CR>
	FHL **		CVFHL 50<CR>
	FHR **		CVFHR 50<CR>
	FWL **		CVFWL 50<CR>
	FWR **		CVFWR 50<CR>
MU	ON	OUTPUT MUTE ON/OFF change	MUON<CR>
	OFF		MUOFF<CR>
SI	CD	INPUT source change	SICD<CR>
	TUNER	---FM TUNER	SITUNER<CR>
	DVD		SIDVD<CR>
	BD	---Blu-ray	SIBD<CR>
	TV	---TV AUDIO	SITV<CR>
	SAT/CBL	---CBL/SAT	SISAT/CBL<CR>
	MPLAY	---MEDIA PLAYER	**SISMPLAY<CR>**
	GAME		SIGAME<CR>
	AUX1	---AUX	**SIAUX1<CR>**

The ***PARAMETER*** of MV, CV ***EVENT*** : Uses two or three ASCII characters. (see page6 J) section)

EVENT	***PARAMETER***	function	example
	NET	---NETWORK	**SINET<CR>**
	PANDORA	(North America model Only)	SIPANDORA<CR>
	SIRIUSXM	(North America model Only)	**SISIRIUSXM<CR>**
	LASTFM	(Europe model Only)	SILASTFM<CR>
	FLICKR		SIFLICKR<CR>
	FAVORITES		SIFAVORITES<CR>
	IRADIO		SIIRADIO<CR>
	SERVER		SISERVER<CR>
	USB/IPOD	---iPod/USB	SIUSB/IPOD<CR>
	USB DIRECT		SIUSB DIRECT<CR>
	IPOD DIRECT		SIIPOD DIRECT<CR>
	USB		SIUSB<CR>
	IPD		SIIPD<CR>
	IRP		**SIIRP<CR>**
	FVP		**SIFVP<CR>**
ZM	ON	MAIN ZONE ON/OFF change	ZMON<CR>
	OFF		ZMOFF<CR>
	FAVORITE1	FAVORITE STATION 1-3 MODE SELECT	**ZMFAVORITE1<CR>**
	FAVORITE2		**ZMFAVORITE2<CR>**
	FAVORITE3		**ZMFAVORITE3<CR>**
	FAVORITE1 MEMORY	FAVORITE STATION 1-3 MODE MEMORY	**ZMFAVORITE1 MEMORY<CR>**
	FAVORITE2 MEMORY		**ZMFAVORITE2 MEMORY<CR>**
	FAVORITE3 MEMORY		**ZMFAVORITE3 MEMORY<CR>**

EVENT	***PARAMETER***	function	example
SR	PHONO | IPOD DIRECT	REC SELECT source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	SRPHONO<CR>
	SOURCE	REC SELECT mode cancel	SRSOURCE<CR>
SD	AUTO	INPUT mode change	SDAUTO<CR>
	HDMI		SDHDMI<CR>
	DIGITAL		SDDIGITAL<CR>
	ANALOG		SDANALOG<CR>
	ARC	ARC playing	SDARC<CR>
	NO	No Input	SDNO<CR>
DC	AUTO	DIGITAL INPUT mode change	DCAUTO<CR>
	PCM		DCPCM<CR>
	DTS		DCDTS<CR>
SV	DVD	VIDEO SELECT mode source change	SVDVD<CR>
	BD	---Blu-ray	SVBD<CR>
	TV	---TV AUDIO	SVTV<CR>
	SAT/CBL	---CBL/SAT	SVSAT/CBL<CR>
	MPLAY	---MediaPlayer	**SVMPLAY**<CR>
	GAME	---GAME	**SVGAME**<CR>
	AUX1	---AUX	**SVAUX1**<CR>
	SOURCE		SVSOURCE<CR>
SLP	OFF	MAIN ZONE SLEEP TIMER setting change	SLPOFF<CR>
	***		SLP120<CR>

EVENT	***PARAMETER***	function	example
MS	DIRECT	SURROUND mode change	MSDIRECT<CR>
	PURE DIRECT		MSPURE DIRECT<CR>
	STEREO		MSSTEREO<CR>
	MULTI CH IN		MSMULTI CH IN<CR>
	M CH IN+PL2X C		MSM CH IN+PL2X C<CR>
	M CH IN+PL2X M		MSM CH IN+PL2X M<CR>
	M CH IN+PL2Z H		MSM CH IN+PL2Z H<CR>
	M CH IN +DOLBY EX		MSM CH IN+DOLBY EX<CR>
	MULTI CH IN 7.1		MSMULTI CH IN 7.1<CR>
	DOLBY PRO LOGIC		MSDOLBY PRO LOGIC<CR>
	DOLBY PL2 C		MSDOLBY PL2 C<CR>
	DOLBY PL2 M		MSDOLBY PL2 M<CR>
	DOLBY PL2 G		MSDOLBY PL2 G<CR>
	DOLBY PL2X C		MSDOLBY PL2X C<CR>
	DOLBY PL2X M		MSDOLBY PL2X M<CR>
	DOLBY PL2X G		MSDOLBY PL2X G<CR>
	DOLBY PL2Z H		MSDOLBY PL2Z H<CR>
	DOLBY DIGITAL		MSDOLBY DIGITAL<CR>
	DOLBY D EX		MSDOLBY D EX<CR>
	DOLBY D +PL2X C		MSDOLBY D+PL2X C<CR>
	DOLBY D +PL2X M		MSDOLBY D+PL2X M<CR>
	DOLBY D +PL2Z H		MSDOLBY D+PL2Z H<CR>
	DTS NEO:6 C		MSDTS NEO:6 C<CR>
	DTS NEO:6 M		MSDTS NEO:6 M<CR>
	DTS SURROUND		MSDTS SURROUND<CR>
	DTS ES DSCRT6.1		MSDTS ES DSCRT6.1<CR>
	DTS ES MTRX6.1		MSDTS ES MTRX6.1<CR>
	DTS+PL2X C		MSDTS+PL2X C<CR>
	DTS+PL2X M		MSDTS+PL2X M<CR>
	DTS+PL2Z H		MSDTS+PL2Z H<CR>

EVENT	***PARAMETER***	function	example
	DTS+NEO:6		MSDTS+NEO:6<CR>
	DTS96/24		MSDTS96/24<CR>
	DTS96 ES MTRX		MSDTS96 ES MTRX<CR>
	MCH STEREO		MSMCH STEREO<CR>
	ROCK ARENA		MSROCK ARENA<CR>
	JAZZ CLUB		MSJAZZ CLUB<CR>
	MONO MOVIE		MSMONO MOVIE<CR>
	MATRIX		MSMATRIX<CR>
	VIDEO GAME		MSVIDEO GAME<CR>
	VIRTUAL		MSVIRTUAL<CR>
	DOLBY D+		MSDOLBY D+<CR>
	DOLBY D+ +EX		MSDOLBY D+ +EX<CR>
	DOLBY D+ +PL2X C		MSDOLBY D+ +PL2X C<CR>
	DOLBY D+ +PL2X M		MSDOLBY D+ +PL2X M<CR>
	DOLBY D+ +PL2Z H		MSDOLBY D+ +PL2Z H<CR>
	DOLBY TRUEHD		MSDOLBY HD<CR>
	DOLBY HD		MSDOLBY HD<CR>
	DOLBY HD+EX		MSDOLBY HD+EX<CR>
	DOLBY HD+PL2X C		MSDOLBY HD+PL2X C<CR>
	DOLBY HD+PL2X M		MSDOLBY HD+PL2X M<CR>
	DOLBY HD+PL2Z H		MSDOLBY HD+PL2Z H<CR>
	DTS HD		MSDTS HD<CR>
	DTS HD MSTR		MSDTS HD MSTR<CR>
	DTS HD+NEO:6		MSDTS HD+NEO:6<CR>
	DTS HD+PL2X C		MSDTS HD+PL2X C<CR>
	DTS HD+PL2X M		MSDTS HD+PL2X M<CR>
	DTS HD+PL2Z H		MSDTS HD+PL2Z H<CR>
	DTS ES 8CH DSCRT		MSDTS ES 8CH DSCRT<CR>
	DTS EXPRESS		MSDTS EXPRESS<CR>
	MPEG2 AAC	(JAPAN model Only)	MSMPEG2 AAC<CR>
	AAC+DOLBY EX	(JAPAN model Only)	MSAAC+DOLBY EX<CR>
	AAC+PL2X C	(JAPAN model Only)	MSAAC+PL2X C<CR>
	AAC+PL2X M	(JAPAN model Only)	MSAAC+PL2X M<CR
	AAC+PL2Z H	(JAPAN model Only)	MSAAC+PL2Z H<CR>

EVENT	***PARAMETER***	function	example
MS	AUDYSSEY DSX		MSAUDYSSEY DSX<CR>
	PL DSX		MSPL DSX<CR>
	PL2 C DSX		MSPL2 C DSX<CR>
	PL2 M DSX		MSPL2 M DSX<CR>
	PL2 G DSX		MSPL2 G DSX<CR>
	NEO:6 C DSX		MSNEO:6 C DSX<CR>
	NEO:6 M DSX		MSNEO:6 M DSX<CR>
	QUICK1	QUICK SELECT mode change	MSQUICK1<CR>
	QUICK2		MSQUICK2<CR>
	QUICK3		MSQUICK3<CR>
	QUICK4		MSQUICK4<CR>
	QUICK5		MSQUICK5<CR>
	QUICK0	---QUICK 1(or 2, 3, 4, 5) Change QUICK SELECT OFF	MSQUICK0<CR>

EVENT	***PARAMETER***	function	example
VS	**MONIAUTO**	HDMI MONITOR setting change	**VS MONIAUTOCR>**
	MONI1		VSMONI1<CR>
	MONI2		VSMONI2<CR>
	ASPNRM	ASPECT setting change	VSASPNRM<CR>
	ASPFUL	NRM=4:3 , FUL=16:9	VSASPFUL<CR>
	SC48P	Resolution(analog) setting change	VSSC48P<CR>
	SC10I		VSSC10I<CR>
	SC72P		VSSC72P<CR>
	SC10P		VSSC10P<CR>
	SC10P24		**VSSC10P24<CR>**
	SC4K		**VSSC4K<CR>**
	SCAUTO		VSSCAUTO<CR>
	SCH48P	Resolution(HDMI) setting change	VSSCH48P<CR>
	SCH10I		VSSCH10I<CR>
	SCH72P		VSSCH72P<CR>
	SCH10P		VSSCH10P<CR>
	SCH10P24		**VSSCH10P24<CR>**
	SCH4K		**VSSCH4K<CR>**
	SCHAUTO		VSSCHAUTO<CR>
	AUDIO AMP	HDMI AUDIO Output setting change	VSAUDIO AMP<CR>
	AUDIO TV		VSAUDIO TV<CR>
	VPMAUTO	Video Mode setting change	VSVPMAUTO<CR>
	VPMGAME		VSVPMGAME<CR>
	VPMMOVI		VSVPMMOVI<CR>

EVENT	***PARAMETER***	function	example
PS	TONE CTRL OFF	TONE CONTROL ON/OFF change	PSTONE CTRL OFF<CR>
	TONE CTRL ON		PSTONE CTRL OFF<CR>
	SB:MTRX ON	SURROUND BACK MODE change	PSSB:MTRX ON<CR>
	SB:PL2X CINEMA		PSSB:PL2X CINEMA<CR>
	SB:PL2X MUSIC		PSSB:PL2X MUSIC<CR>
	SB:ON		PSSB:ON<CR>
	SB:OFF		PSSB:OFF<CR>
	SB:ESMTRX		PSSB:ESMTRX<CR>
	CINEMA EQ.ON	CINEMA EQ. ON/OFF change	PSCINEMA EQ.ON<CR>
	CINEMA EQ.OFF		PSCINEMA EQ.OFF<CR>
	MODE:CINEMA	CINEMA / MUSIC / GAME / PL /HEIGHT mode change	PSMODE:CINEMA<CR>
	MODE:MUSIC		PSMODE:MUSIC<CR>
	MODE:GAME		PSMODE:GAME<CR>
	MODE:PRO LOGIC		PSMODE:PRO LOGIC<CR>
	MODE:HEIGHT		PSMODE:HEIGHT<CR>
	LOM ON	Loudness Management ON/OFF change	**PSLOM ON<CR>**
	LOM OFF		**PSLOM OFF<CR>**
	FH:ON	FRONT HEIGHT Output ON/OFF change	PSFH:ON<CR>
	FH:OFF		PSFH:OFF<CR>
	PHG LOW	PLⅡz HEIGHT GAIN change	PSPHG LOW<CR>
	PHG MID		PSPHG MID<CR>
	PHG HI		PSPHG HI<CR>
	MULTEQ:AUDYSSEY	MultEQ XT/MultEQ mode change	PSMULTEQ:AUDYSSEY<CR>
	MULTEQ:BYP.LR		PSMULTEQ:BYP.LR<CR>
	MULTEQ:FLAT		PSMULTEQ:FLAT<CR>
	MULTEQ:MANUAL		PSMULTEQ:MANUAL<CR>
	MULTEQ:OFF		PSMULTEQ:OFF<CR>
	DYNEQ ON	DYNAMIC EQ ON/OFF change	PSDYNEQ ON<CR>
	DYNEQ OFF		PSDYNEQ OFF<CR>

EVENT	***PARAMETER***	function	example
PS	REFLEV 0	Reference Level Offset change	PSREFLEV 0<CR>
	REFLEV 5		PSREFLEV 5<CR>
	REFLEV 10		PSREFLEV 10<CR>
	REFLEV 15		PSREFLEV 15<CR>
	DYNVOL HEV	DYNAMIC VOLUME change	**PSDYNVOL HEV<CR>**
	DYNVOL MED		**PSDYNVOL MED<CR>**
	DYNVOL LIT		**PSDYNVOL LIT<CR>**
	DYNVOL OFF		**PSDYNVOL OFF<CR>**
	DSX ONH	Audyssey DSX change	PSDSX ON<CR>
	DSX ONW		PSDSX ON<CR>
	DSX OFF		PSDSX OFF<CR>
	STW **	STAGE WIDTH change	PSSTW 50<CR>
	STH **	STAGE HEIGHT change	PSSTH 50<CR>
	BAS **	BASS change	PSBAS 50<CR>
	TRE **	TREBLE change	PSTRE 50<CR>
	BAS **	BASS change	PSBAS 50<CR>
	TRE **	TREBLE change	PSTRE 50<CR>
	DRC AUTO	Dynamic Compression change	PSDRC AUTO<CR>
	DRC LOW	When the input signal is Dolby TrueHD	PSDRC LOW<CR>
	DRC MID		PSDRC MID<CR>
	DRC HI		PSDRC HI<CR>
	DRC OFF		PSDRC OFF<CR>
	LFE **	LFE change	PSLFE 10<CR>
	EFF **	EFFECT LEVEL change	PSEFF 10<CR>
	DEL ***	DELAY change	PSDEL 100<CR>

EVENT	***PARAMETER***	function	example
PS	PAN ON	PANORAMA ON/OFF change	PSPAN ON<CR>
	PAN OFF		PSPAN OFF<CR>
	DIM **	DIMMENSION change	PSDIM 06<CR>
	CEN **	CENTER WIDTH change	PSCEN 07<CR>
	CEI **	CENTER IMAGE change	PSCEI 10<CR>
	SWR ON	SW ON/OFF change	PSSWR ON<CR>
	SWR OFF		PSSWR OFF<CR>
	RSZ S	ROOM SIZE change	PSRSZ S<CR>
	RSZ MS		PSRSZ MS<CR>
	RSZ M		PSRSZ M<CR>
	RSZ ML		PSRSZ ML<CR>
	RSZ L		PSRSZ L<CR>
	DELAY ***	AUDIO DELAY change	PSDELAY 200<CR>
	RSTR OFF	AUDIO RESTORER change	PSRSTR OFF<CR>
	RSTR MODE1		PSRSTR MODE1<CR>
	RSTR MODE2		PSRSTR MODE2<CR>
	RSTR MODE3		PSRSTR MODE3<CR>
	FRONT SPA	FRONT SPEAKER direct change	PSFRONT SPA<CR>
	FRONT SPB		PSFRONT SPB<CR>
	FRONT SPA+B		PSFRONT A+B<CR>

EVENT	***PARAMETER***	function	example
PV	CN **	CONTRAST change	PVCN 50<CR>
	BR **	BRIGHTNESS Change	PVBR 12<CR>
	CM **	CROMA LEVEL change	PVCM 50<CR>
	HUE **	Hue Change	PVHUE 50<CR>
	DNR OFF	DNR change	PVDNR OFF<CR>
	DNR LOW		PVDNR LOW<CR>
	DNR MID		PVDNR MID<CR>
	DNR HI		PVDNR HI<CR>
	ENH **	ENHANCER change	PVENH 12<CR>

EVENT	***PARAMETER***	function	example
Z2	CD | USB DIRECT IPOD DIRECT	ZONE2 source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z2CD<CR> | Z2USB DIRECT<CR> Z2IPOD DIRECT<CR>
	SOURCE	ZONE2 mode cancel	Z2SOURCE<CR>
	QUICK1	ZONE2 QUICK SELECT mode change	Z2QUICK1<CR>
	QUICK2		Z2QUICK2<CR>
	QUICK3		Z2QUICK3<CR>
	QUICK4		Z2QUICK4<CR>
	QUICK5		Z2QUICK5<CR>
	QUICK0	---Z2 QUICK SELECT 1(or 2, 3, 4, 5) Change QUICK SELCT OFF	Z2QUICK0<CR>
	FAVORITE1	ZONE2 FAVORITE STATION 1-3 MODE SELECT	**Z2FAVORITE1<CR>**
	FAVORITE2		**Z2FAVORITE2<CR>**
	FAVORITE3		**Z2FAVORITE3<CR>**
	FAVORITE1 MEMORY	ZONE2 FAVORITE STATION 1-3 MODE MEMORY	**Z2FAVORITE1 MEMORY<CR>**
	FAVORITE2 MEMORY		**Z2FAVORITE2 MEMORY<CR>**
	FAVORITE3 MEMORY		**Z2FAVORITE3 MEMORY<CR>**
	**	ZONE2 VOLUME change , **:00 to 98 by ASCII 98 = 18dB(MAX) 80 = 00dB 01 = -79dB 00 = ---(MIN)	Z280<CR>
	ON	ZONE2 ON/OFF change	Z2ON<CR>
	OFF		Z2OFF<CR>
Z2MU	ON	ZONE2 OUTPUT MUTE ON/OFF change	Z2MUON<CR>
	OFF		Z2MUOFF<CR>

The ***PARAMETER*** of Z2 ***EVENT*** : Uses two ASCII characters. (see page4 J) section)

EVENT	***PARAMETER***	function	example
Z2CS	ST	ZONE2 Channel setting	Z2CSST<CR>
	MONO		Z2CSMONO<CR>
Z2CV	FL **	**:38 to 62 by ASCII , 50=0dB	Z2CVFL 50<CR>
	FR **	**:38 to 62 by ASCII , 50=0dB	Z2CVFR 50<CR>
Z2HPF	ON	ZONE2 HPF ON/OFF change	Z2HPFON<CR>
	OFF		Z2HPFOFF<CR>
Z2PS	BAS **	ZONE2 BASS change	Z2PSBAS 50<CR>
	TRE **	ZONE2 TEBLE change	Z2PSTRE 50<CR>

The ***PARAMETER*** of Z2 ***EVENT*** : Uses two ASCII characters. (see page4 J) section)

EVENT	***PARAMETER***	function	example
Z2	CD | USB DIRECT IPOD DIRECT	ZONE2 source change ---The name of PARAMETER is the same as that of the time of SI COMMAND.	Z2CD<CR> | Z2USB DIRECT<CR> Z2IPOD DIRECT<CR>
	SOURCE	ZONE2 mode cancel	Z2SOURCE<CR>
	QUICK1	ZONE2 QUICK SELECT mode change	Z2QUICK1<CR>
	QUICK2		Z2QUICK2<CR>
	QUICK3		Z2QUICK3<CR>
	QUICK4		Z2QUICK4<CR>
	QUICK5		Z2QUICK5<CR>
	QUICK0	---Z2 QUICK SELECT 1(or 2, 3, 4, 5) Change QUICK SELCT OFF	Z2QUICK0<CR>
	FAVORITE1	ZONE2 FAVORITE STATION 1-3 MODE SELECT	**Z2FAVORITE1<CR>**
	FAVORITE2		**Z2FAVORITE2<CR>**
	FAVORITE3		**Z2FAVORITE3<CR>**
	FAVORITE1 MEMORY	ZONE2 FAVORITE STATION 1-3 MODE MEMORY	**Z2FAVORITE1 MEMORY<CR>**
	FAVORITE2 MEMORY		**Z2FAVORITE2 MEMORY<CR>**
	FAVORITE3 MEMORY		**Z2FAVORITE3 MEMORY<CR>**
	**	ZONE2 VOLUME change , **:00 to 98 by ASCII 98 = 18dB(MAX) 80 = 00dB 01 = -79dB 00 = ---(MIN)	Z280<CR>
	ON	ZONE2 ON/OFF change	Z2ON<CR>
	OFF		Z2OFF<CR>
Z2MU	ON	ZONE2 OUTPUT MUTE ON/OFF change	Z2MUON<CR>
	OFF		Z2MUOFF<CR>
Z2CV	FL **	**:38 to 62 by ASCII , 50=0dB	Z2CVFL 50<CR>
	FR **	**:38 to 62 by ASCII , 50=0dB	Z2CVFR 50<CR>

The ***PARAMETER*** of Z2 ***EVENT*** : Uses two ASCII characters. (see page4 J) section)

※ANALOG TUNER Control

EVENT	***PARAMETER***	function	example
TF	AN****** (6 digits)	TUNER Frequency change --- ****.** kHz at AM band ****.** MHz at FM band	TFAN105000<CR> (1050.00kHz at AM)
TP	AN**(PRESET No.)	TUNER PRESET change to No.** ****:A1-G8(CH1-56) , A5=CH5, B2=CH10, C4=CH20**	TPANA1<CR> (PRESET No."A01")
	ANOFF	Change Preset Channel select OFF	TPANOFF<CR>
	ANMEM**	TUNER PRESET MEMORY ****:A1-G8(CH1-56) , A5=CH5, B2=CH10, C4=CH20**	TPANMEMA1<CR>
TM	ANAUTO	---Tuning mode set to AUTO mode	TMANAUTO<CR>
	ANMANUAL	---Tuning mode set to MANUAL mode	TMANMANUAL<CR>

※Network Audio/USB /iPod DIRECT Extended Control

EVENT	*PARAMETER*	function	example
NSA		Onscreen Display Information is Answered By the NSA Command.	
	0	Display Line1 Information	NSA0********** _?????<CR>
	1	Display Line3 Information	NSA1※********** _?????<CR>
	2	Display Line4 Information	NSA2※********** _?????<CR>
	3	Display Line5 Information	NSA3※********** _?????<CR>
	4	Display Line6 Information	NSA4※********** _?????<CR>
	5	Display Line7 Information	NSA5※********** _?????<CR>
	6	Display Line8 Information	NSA6※********** _?????<CR>
	7	Display Line9 Information	NSA7********** _?????<CR>
	8	Display Line10 Information	NSA8**********_?????<CR> *:Character Length MAX96byte _:Null ?:Exclusion(The character after Null should be disregarded) ※:Cursor&Playable Information Data(1Byte) Bit1:Playable Music Bit2:Directory Bit4:CURSOR SELECT=1 Bit7:Picture Bit3,5,6,8:Don't Care
			NSA0Now Playing USB_????<CR> NSA1※Come Away With Me_???<CR> NSA2※Norah Jones_?????????<CR> NSA3※_??????????????????<CR> NSA4※_??????????????????<CR> NSA5※00:11 100%_???????<CR> NSA6※_??????????????????<CR> NSA7_??????????????????<CR> NSA8_??????????????????<CR>

EVENT	***PARAMETER***	function	example
NSE		Onscreen Display Information(mServer/iRadio) is Answered By the NSE Command.	
	0	Display Line1 Information	NSE0********** _?????<CR>
	1	Display Line3 Information	NSE1※********** _?????<CR>
	2	Display Line4 Information	NSE2※********** _?????<CR>
	3	Display Line5 Information	NSE3※********** _?????<CR>
	4	Display Line6 Information	NSE4※********** _?????<CR>
	5	Display Line7 Information	NSE5※********** _?????<CR>
	6	Display Line8 Information	NSE6※********** _?????<CR>
	7	Display Line9 Information	NSE7********** _?????<CR>
	8	Display Line10 Information	NSE8**********_?????<CR> *:UTF-8 CODE Character(MAX96byte) _:Null ?:Don't Care (The character after Null should be disregarded) ※:Cursor&Playable Information Data(1Byte) Bit1:Playable Music =1 Bit2:Directory Bit4:CURSOR SELECT=1 Bit7:Picture Bit3,5,6,8:Don't Care ********** _?????:96byte Fixed
			<example> NSE0Now Playing USB_????<CR> NSE1※Come Away With Me_???<CR> NSE2※Norah Jones_?????????<CR> NSE3※_??????????????????<CR> NSE4※_??????????????????<CR> NSE5※00:11 100%_???????<CR> NSE6※_??????????????????<CR> NSE7_??????????????????<CR> NSE8_??????????????????<CR>

COMMAND	*PARAMETER*	function	example
NS	**B** **(PRESET No.)**	**Preset Call** **** : 00-55 00=CH01,55=CH56**	**NSB00<CR>**
	C **(PRESET No.)**	**Preset Memory**, Preset stored at No.** **** : 00-55 00=CH01,55=CH56**	**NSC00<CR>**
	H	**Return Preset Channel CH1-CH56 status (UTF-8)** **** : 00-55 00=CH01,55=CH56**	**NSH00**********(20 digits)<CR>** **NSH01**********(20 digits)<CR>** **|** **NSH54**********(20 digits)<CR>** **NSH55**********(20 digits)<CR>**

※TRIGGER CONTROL

EVENT	*PARAMETER*	function	example
TR	**1 ON**	Trigger 1 ON	**TR1 ON<CR>**
	1 OFF	Trigger 1 OFF	**TR1 OFF<CR>**

※Remote Lock/Panel Lock

EVENT	*PARAMETER*	function	example
SY	REMOTE LOCK ON	REMOTE CONTROL LOCK ON/OFF	SYREMOTE LOCK ON<CR>
	REMOTE LOCK OFF		SYREMOTE LOCK OFF<CR>
	PANEL LOCK ON	PANEL BUTTON(Except MASTER VOL.)CONTROL LOCK ON	SYPANEL LOCK ON<CR>
	PANEL+V LOCK ON	PANEL BUTTON & MASTER VOL. CONTROL LOCK ON	SYPANEL+V LOCK ON<CR>
	PANEL LOCK OFF	PANEL BUTTUM & MASTER VOL. CONTROL LOCK OFF	SYPANEL LOCK OFF<CR>

※UPGRADE ID Display

COMMAND	*PARAMETER*	function	example
UG	IDN **********	ID Number for UPGRADE is displayed on FL Display **********:12-digit ID Number	UGIDN **********<CR>
	IDN NG	Can't get ID number from DPMS	UGIDN NG<CR>

Extension COMMAND

- **The RC code can be sent from Serial protocol commands**

Protocol specification

Command structure: COMMAND + RC FORMAT + RC DATA + CR (0x0D)

COMMAND : ASCII CODE of 2 characters

Ex. RC : RC CODE

RC FORMAT : ASCII CODE of 3 characters

Ex. **KSK** : KASEIKYO FORMAT

SHP : SHARP FORMAT

RC DATA : ASCII CODE of 7 characters

※For details of the RC CODE , please refer to the IR remote control code list.

KASEIKYO FORMAT

REMOTE ID SET : 1

K4-1 : MAIN ZONE																								
No.	GENRE2				Data										ID		parity								Key Name
	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	
RCKSK0410002	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	ALL POWER ON
RCKSK0410003					1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	1	0	ALL POWER OFF
RCKSK0410006					0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	MAIN ZONE ON
RCKSK0410007					1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	MAIN ZONE OFF

SHARP FORMAT

No.	Data (C6~C11)	Key Name	No.	Data (C6~C11)	Key Name
RCSHP023032	000001	ENTER	RCSHP023048	000011	MUTING
RCSHP023033	100001	POWER ON	RCSHP023049	100011	MASTER VOLUME UP
RCSHP023034	010001	POWER OFF	RCSHP023050	010011	MASTER VOLUME DOWN
RCSHP023035	110001	DVD	RCSHP023051	110011	SL LEVEL UP
RCSHP023036	001001	STANDARD(DOLBY/DTS SURR.)	RCSHP023052	001011	SL LEVEL DOWN
RCSHP023037	101001	SW LEVEL DOWN	RCSHP023053	101011	CENTER LEVEL UP

The example of a command * <CR> is the meaning of 0x0D.

RCKSK0410002<CR> : All Power ON by using KASEIKYO FORMAT

RCSHP0230033<CR> : All Power ON by using SHARP FORMAT