

Marantz
RS232C Control specification
For
SR9300 / SR8300

Category : *AV Receiver*
Document Version : *2.00*
Date : *2003/05/09*

Table of Contents

1. Introduction	3
1-1. Purpose	3
1-2. Scope	3
1-3. Abbreviations	3
1-4. References	3
2. Global Description	3
2-1. Overview	3
2-2. Block Diagram	3
2-3. Interface connector specification of This Product	3
2-4. Assumptions and Dependencies	3
3. Detailed Description	4
3-1. Connection format	4
3-1-1. Physical connection	4
3-1-1-1. Data transmission sequence from Host to Slave	4
3-1-1-2. Data transmission sequence from Slave to Host	4
3-2. Transmission data format	5
3-2-1. Transmission data format from Host to Slave	5
3-2-1-1. Form1: Command	5
3-2-1-2. Form2: Status request	5
3-2-2. Transmission data format from Slave to Host	5
3-2-2-1. Form1: ACK/NAK	5
3-2-2-2. Form2: Status answer	5
3-3. The transaction sequences and the regulations	6
3-3-1. The transaction sequences	6
3-3-2. The transaction regulations	6
3-3-3. Example of the transactions	6
3-3-4. Examples of the handshaking flowchart	7
3-3-4-1. Example of successful handshaking	7
3-3-4-2. Example of error handshaking	7
3-4. Command list	8
3-4-1. Normal Command list	8
3-4-2. Special Command list	10
3-5. Status request and Status answer list	11
3-5-1. Normal Status request and Status answer list	11
3-5-2. Special Status request and Status answer list	16

1. Introduction

1-1. Purpose

This document was written in order to clarify specification for control this product by the host controller.

1-2. Scope

This document would be using by software or hardware engineers for production of this product.

This product is [marantz SR9300/SR8300/PS9200V2]. (It's referred to as "This product" after this.)

1-3. Abbreviations

Abbreviation	Description

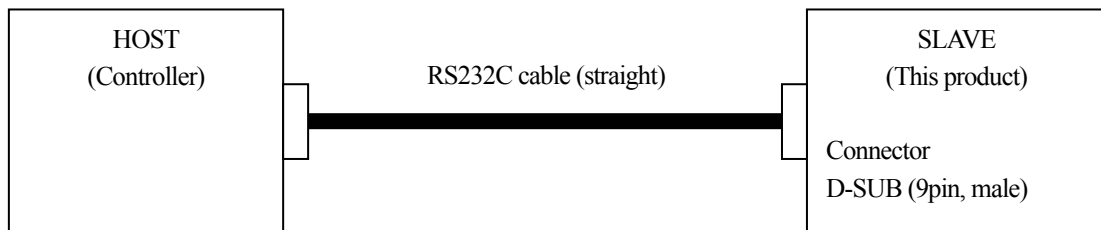
1-4. References

2. Global Description

2-1. Overview

A Host controller can control or watch out this product as a Slave very easily via the communication cable.

2-2. Block Diagram



2-3. Interface connector specification of This Product

Processor Interface	Signal name	Connection device	D-Sub Pin	Connector
-	N.C.	-	1	RS232C D-SUB (9pin,male)
UART	TxD (output)	RS232C Level shift driver	2	
	RxD (input)		3	
-	N.C.	-	4	
-	GND	-	5	
-	N.C.	-	6	
GENERAL PORT	CTS (input)	RS232C Level shift driver	7	
	RTS (output)		8	
-	N.C.	-	9	

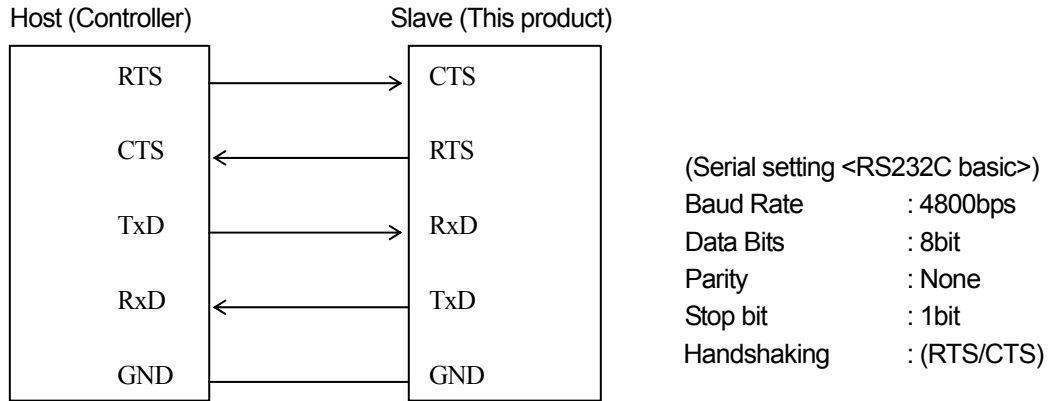
2-4. Assumptions and Dependencies

3. Detailed Description

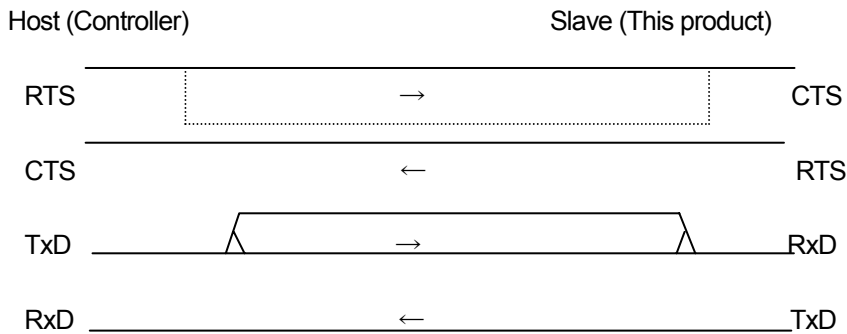
The interface specification between this product and a Host controller is described below.

3-1. Connection format

3-1-1. Physical connection

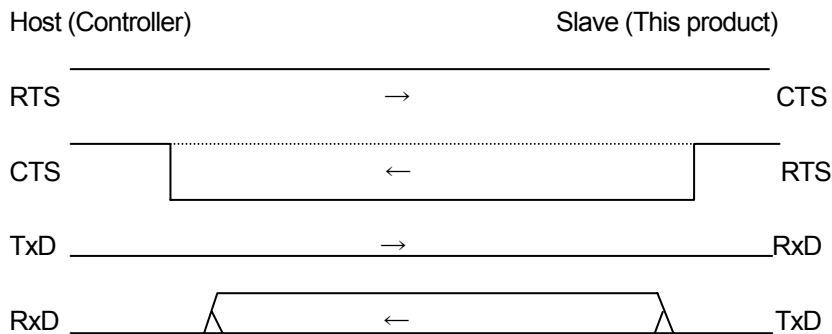


3-1-1-1. Data transmission sequence from Host to Slave



1. The host checks that CTS is High, then starts a data transmission from TxD.
 2. The host performs the data transmission of the number of required bytes, and ends a transmission.
- * The host can do RTS to Low during the transmission for disable data transmission from a slave.

3-1-1-2. Data transmission sequence from Slave to Host



1. The slave checks that CTS is High, then starts a data transmission from TxD.
 2. The slave performs the data transmission of the number of required bytes, and ends a transmission.
- * The slave can do RTS to Low during the transmission for disable data transmission from a host.

3-2. Transmission data format

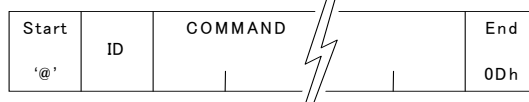
3-2-1. Transmission data format from Host to Slave

There are two kinds of transmission data form from Host shown below.

3-2-1-1. Form1: Command

Command is a data that requests some status change.

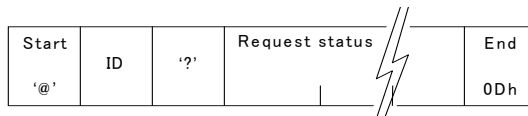
Start character : '@'
 ID : '0' ~ '9' (A Slave has own ID, A Host has to set the ID.)
 COMMAND : see "Command list"
 End character : 0Dh



3-2-1-2. Form2: Status request

Status request is a data that requests a answer of some status.

Start character : '@'
 ID : '0' ~ '9' (A Slave has own ID, A Host has to set the ID.)
 Request character : '?'
 Request status : see "Status request list"
 End character : 0Dh



3-2-2. Transmission data format from Slave to Host

There are two kinds of transmission data form from Slave shown below.

3-2-2-1. Form1: ACK/NAK

ACK is a reply data from Slave when Slave got an acceptable command data from Host.

ACK : 06h



NAK is a reply data from Slave when Slave got an incorrect Command data, Status request data or some other data from Host.

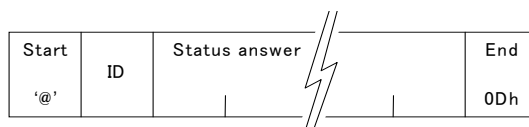
NAK : 15h



3-2-2-2. Form2: Status answer

Status answers are reply data when Slave got an acceptable Request status data from Host.

Start character : '@'
 ID : '0' ~ '9' (A Slave will set own ID.)
 Answer character : see "Status answer list"
 End character : 0Dh



3-3. The transaction sequences and the regulations

3-3-1. The transaction sequences

The transactions have two kinds of sequence.

* A transaction is a Command from Host then the Slave will be an answer by ACK or NAK.

* A transaction is a Status request from Host then the Slave will be an answer by Status answer.

3-3-2. The transaction regulations

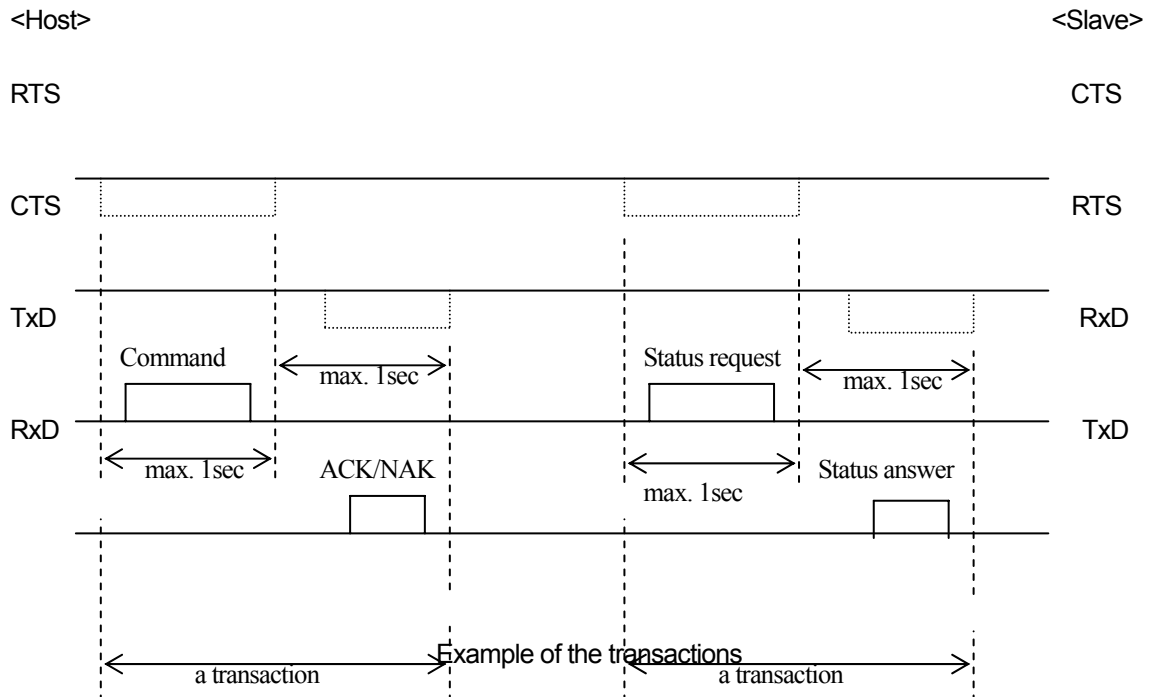
The transactions have some kinds of regulation.

* A Command or a Status request transmission by the Host has to finish within one second.

* An answer (ACK, NAK or Status answer) transmission by the Slave has to finish within one second when got a Command or a Status request from the Host.

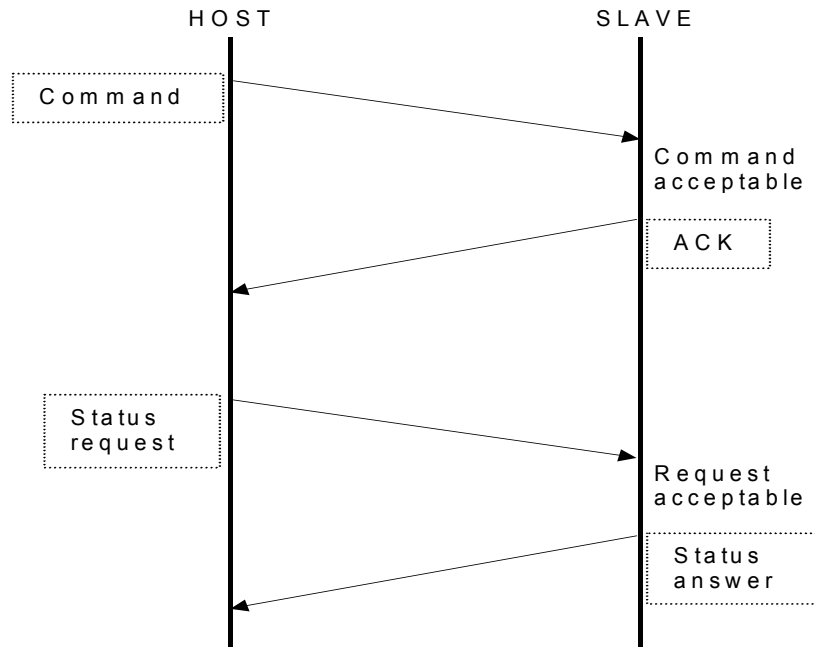
* The Host must not transmit an another Command or Status request until "it receives a answer by a previous Command or Status request" or "it passes one second from a finishing of previous transmission of a Command or a Status request".

3-3-3. Example of the transactions

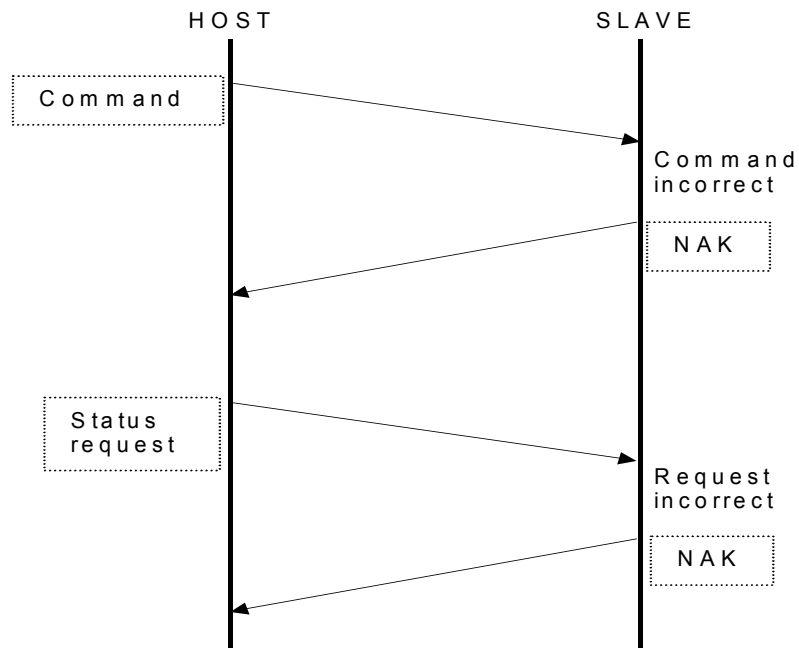


3-3-4. Examples of the handshaking flowchart

3-3-4-1. Example of successful handshaking



3-3-4-2. Example of error handshaking



3-4. Command list

3-4-1. Normal Command list

(Samples indicated the ID set to as '1'.)

Command		Character	Sample
POWER	POWER	A0	"@1A0",0x0D
	POWER ON	A1	"@1A1",0x0D
	POWER OFF	A2	"@1A2",0x0D
INPUT SELECT Main Room / (Multi Room)	DSS	B0 / (Ba)	"@1B0",0x0D
	TV	B1 / (Bb)	"@1B1",0x0D
	LD	B2 / (Bc)	"@1B2",0x0D
	DVD	B3 / (Bd)	"@1B3",0x0D
	VCR1	B4 / (Be)	"@1B4",0x0D
	VCR2 / DVD-R	B5 / (Bf)	"@1B5",0x0D
	AUX1	B6 / (Bg)	"@1B6",0x0D
	AUX2	B7 / (Bh)	"@1B7",0x0D
	DVD-R	B8 / (Bi)	"@1B8",0x0D
	CD	B9 / (Bj)	"@1B9",0x0D
	TAPE	BA / (Bk)	"@1BA",0x0D
	CD-R	BB / (Bl)	"@1BB",0x0D
	FM	BC / (Bm)	"@1BC",0x0D
	AM	BD / (Bn)	"@1BD",0x0D
	MW	BE / (Bo)	"@1BE",0x0D
	LW	BF / (Bp)	"@1BF",0x0D
	TUNER	BG / (Bq)	"@1BG",0x0D
MULTI-CHANNEL	MULTI-CHANNEL INPUT ON	BH	"@1BH",0x0D
	MULTI-CHANNEL INPUT OFF	BI	"@1BI",0x0D
INPUT SIGNAL	A/D	BJ	"@1BJ",0x0D
TUNNER FREQ	AUTO-TUNE	C0	"@1C0",0x0D
	FREQ. UP	C1	"@1C1",0x0D
	FREQ. DOWN	C2	"@1C2",0x0D
TUNNER PRESET	PRESET INFO.	C3	"@1C3",0x0D
	P-SCAN	C4	"@1C4",0x0D
	PRESET UP	C5	"@1C5",0x0D
	PRESET DOWN	C6	"@1C6",0x0D
F-DIRECT	F-DIRECT	C7	"@1C7",0x0D
TUNER MODE	T-MODE	C8	"@1C8",0x0D
MEMO/CLR	CLR	D0	"@1D0",0x0D
	MEMO	D1	"@1D1",0x0D
DIRECT KEY	DIRECT KEY 0	E0	"@1E0",0x0D
	DIRECT KEY 1	E1	"@1E1",0x0D
	DIRECT KEY 2	E2	"@1E2",0x0D
	DIRECT KEY 3	E3	"@1E3",0x0D
	DIRECT KEY 4	E4	"@1E4",0x0D
	DIRECT KEY 5	E5	"@1E5",0x0D
	DIRECT KEY 6	E6	"@1E6",0x0D
	DIRECT KEY 7	E7	"@1E7",0x0D
	DIRECT KEY 8	E8	"@1E8",0x0D
	DIRECT KEY 9	E9	"@1E9",0x0D

Command		Character	Sample
SURROUND MODE	AUTO	F0	"@1F0",0x0D
	THX MUSIC	F1	"@1F1",0x0D
	THX SURR EX	F2	"@1F2",0x0D
	THX CINEMA	F3	"@1F3",0x0D
	DTS	F4	"@1F4",0x0D
	DTS ES	F5	"@1F5",0x0D
	DOLBY	F6	"@1F6",0x0D
	DOLBY PROLOGIC	F7	"@1F7",0x0D
	DOLBY PL II MOVIE	F8	"@1F8",0x0D
	DOLBY PL II MUSIC	F9	"@1F9",0x0D
	VIRTUAL	FA	"@1FA",0x0D
	S DIRECT	FB	"@1FB",0x0D
	MOVIE	FC	"@1FC",0x0D
	HALL	FD	"@1FD",0x0D
	MATRIX	FE	"@1FE",0x0D
	Mch-STEREO	FF	"@1FF",0x0D
	STEREO	FG	"@1FG",0x0D
	NEO6 CINEMA	FI	"@1FI",0x0D
	NEO6 MUSIC	FJ	"@1FJ",0x0D
	THX ULTRA2	FK	"@1FK",0x0D
	CS II MUSIC	FL	"@1FL",0x0D
	CS II CINEMA	FM	"@1FM",0x0D
	SURR MODE	FN	"@1FN",0x0D
	CS II MONO	FO	"@1FO",0x0D
SURR. MODE NEXT	FX	"@1FX",0x0D	
SURR. MODE PREV.	FY	"@1FY",0x0D	
VOLUME	VOLUME UP	G0	"@1G0",0x0D
	VOLUME DOWN	G1	"@1G1",0x0D
	VOLUME UP FAST	G2	"@1G2",0x0D
	VOLUME DOWN FAST	G3	"@1G3",0x0D
	BASS UP	G4	"@1G4",0x0D
TONE	BASS DOWN	G5	"@1G5",0x0D
	TREBLE UP	G6	"@1G6",0x0D
	TREBLE DOWN	G7	"@1G7",0x0D
	SLEEP MODE	H0	"@1H0",0x0D
MUTE	MUTE OFF	H1	"@1H1",0x0D
	MUTE ON	H2	"@1H2",0x0D
VIDEO MUTE	VIDEO MUTE	H3	"@1H3",0x0D
ATT	ATT	H4	"@1H4",0x0D
TEST TONE	TEST TONE	I0	"@1I0",0x0D
NIGHT	NIGHT	J0	"@1J0",0x0D

3-5. Status request and Status answer list

3-5-1. Normal Status request and Status answer list

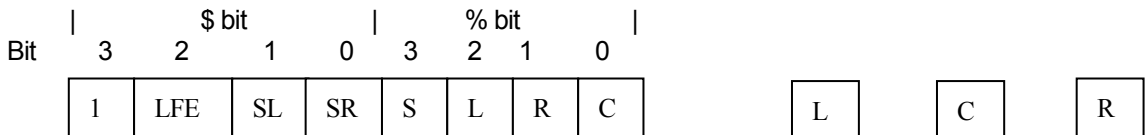
(Samples indicated the ID set to as '1'.)

Request Status	Char. & Sample	Status answer	Char. & Sample
POWER Status	'A' ("@1?A",0x0D)	POWER ON	A0 ("@1A0",0x0D)
		POWER OFF	A1
VIDEO INPUT	'B' ("@1?B",0x0D)	DSS	B0
		TV	B1
		LD	B2
		DVD	B3
		VCR-1	B4
		VCR-2	B5
		AUX1	B6
		AUX2	B7
		DVD-R	B8
		AUDIO INPUT	'C' ("@1?C",0x0D)
TV	C1		
LD	C2		
DVD	C3		
VCR-1	C4		
VCR-2/DVD-R	C5		
AUX1	C6		
AUX2	C7		
DVD-R	C8		
CD	C9		
TAPE	CA		
CD-R	CB		
FM	CC		
AM	CD		
MW	CE		
LW	CF		
MULTI-CHANNEL INPUT	CG		
TUNER	CH		
INPUT MODE	'D' ("@1?D",0x0D)	DIGIAL	D0
		ANALOGUE	D1
TUNER FFREQUENCY	'E' ("@1?E",0x0D)	TUNER FREQUENCY XXXX=076.00-108.00(FM) =520-1710(AM,MW) = 152-282(LW)	E0XXXX (FM:87.50 = "8750") (FM:108.00="0800") (MW: 520="0520") (MW:1710="1710")
		Not available	E- ("@1E-",0x0D)
TUNER PRESET	'F' ("@1?F",0x0D)	Preset No (XX=01~50) Not Preset mode (XX=00)	F0XX
		Not available	F- ("@1F-",0x0D)
TUNER MODE	'G' ("@1?G",0x0D)	AUTO STEREO	G1
		MONO	G0
		Not available	G-
VOLUME Status	'H' ("@1?H",0x0D)	VOL.= XXXdB (XXX = -90~+99)	H0XXX ("@1H0-15",0x0D)
		max	H1
		min (-∞)	H2
BASS Status	'I' ("@1?I",0x0D)	BASS:xxdB(xx=-9~+9)	I0xx
TREBLE Status	'J' ("@1?J",0x0D)	TREBLE:xxdB(xx=-9~+9)	J0xx
ATT Status	'K' ("@1?K",0x0D)	ATT ON	K1
		ATT OFF	K0

Request Status	Char. & Sample	Status answer	Char. & Sample
SURROUND MODE	'L' ("@1?L",0x0D)	AUTO	L0 ("@1L0",0x0D)
		THX 5.1	L1
		THX SURR EX	L2
		THX CINEMA	L3
		THX MUSIC	L4
		DTS MUSIC	L5
		DTS CINEMA	L6
		DTS ES	L7
		NEO 6 CINEMA	L8
		NEO 6 MUSIC	L9
		D DIGITAL	LA
		DD PROLOGIC	LB
		DD PL II MOVIE	LC
		DD PL II MUSIC	LD
		CS II CINEMA	LE
		CS II MUSIC	LF
		VIRTUAL	LG
		S DIRECT	LH
		MOVIE	LI
		HALL	LJ
MATRIX	LK		
Mch-STEREO	LL		
STEREO	LM		
MONO	LN		
THX ULTRA2	LO		
CS II MONO	LP		
SLEEP TIMER Status	'M' ("@1?M",0x0D)	SLEEP OFF	M0
		SLEEP XXX(001~120)	M1XXX
DISPLAY Status	'N' ("@1?N",0x0D)	DISPLAY ON	N0
		DISPLAY OFF	N1
		AUTO DISPLAY OFF	N2
		DISPLAY DIMMER	N3~N9 (dimmer level)
OSD Status	'O' ("@1?O",0x0D)	OSD ON	O0
		OSD OFF	O1
TEST TONE Status	'P' ("@1?P",0x0D)	TEST TONE OFF	P0
		TEST TONE L	P1
		TEST TONE C	P2
		TEST TONE R	P3
		TEST TONE SR	P4
		TEST TONE SBR	P5
		TEST TONE SBL	P6
		TEST TONE SL	P7
		TEST TONE SW	P8
TEST TONE MODE	'Q' ("@1?Q",0x0D)	TEST TONE AUTO	Q0
		TEST TONE MANUAL	Q1
NIGHT MODE	'R' ("@1?R",0x0D)	NIGHT MODE ON	R0
		NIGHT MODE OFF	R1
MENU	'S' ("@1?S",0x0D)	MENU ON	S0
		MENU OFF	S1

Request Status	Char. & Sample	Status answer	Char. & Sample
F-DIRECT	'T' ("@1?T",0x0D)	F-DIRECT ON	T1 ("@1T1",0x0D)
		F-DIRECT OFF	T0
		Not available	T-
SIGNAL FORMAT	'U' ("@1?U",0x0D)	D DIGITAL(AC-3)	U0
		DD SURROUND	U1
		DD SURR EX	U2
		DTS	U3
		DTS ES	U4
		AAC	U5
		MPEG	U6
		MLP	U7
		PCM	U8
		HDCD	U9
		DSD	UA
		OTHER	UB
		NONE_DETECTION	UC
		SAMPLING FREQ.	'V' ("@1?V",0x0D)
44.1K	V1		
48K	V2		
88.2K	V3		
96K	V4		
176.4K	V5		
192K	V6		
OUT OF RANGE	V7		
Not available	V-		
CHANNEL STATUS	'W' ("@1?W",0x0D)	See below	W1\$%
		Not available	W-

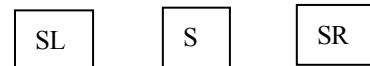
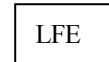
* Description of CHANNEL STATUS answer character. (about : \$%)
 (Character \$ and % would be '0' to '9' or 'A' to 'F', it uses to as hex. bit data.)



When a bit of channel status is effective, it sets to 1.
 And when it is opposite condition, it sets to 0.

ex.)

- * If front L and R channel status are only effective, it will send "@1W146",0Dh.
- * If front and surr. L/R channel status are effective, it will send "@1W1B6",0Dh.
- * If all channel status are effective, it will send "@1W1FF",0Dh.
- * If all channel status are not effective, it will send "@1W180",0Dh.



Request Status	Char. & Sample	Status answer	Char. & Sample
MULTIROOM Status	'X' ("@1X?",0x0D)	MULTI ROOM ON	X0 ("@1X0",0x0D)
		MULTI ROOM OFF	X1
		Not available	X-
VIDEO INPUT (Multi Room)	'Y' ("@1?Y",0x0D)	DSS	Y0
		TV	Y1
		LD	Y2
		DVD	Y3
		VCR1	Y4
		VCR2/DVD-R	Y5
		AUX1	Y6
		AUX2	Y7
		DVD-R	Y8
		Not available	Y-
		AUDIO INPUT (Multi Room)	'Z' ("@1?Z",0x0D)
TV	Z1		
LD	Z2		
DVD	Z3		
VCR1	Z4		
VCR2 / (DVD-R)	Z5		
AUX1	Z6		
AUX2	Z7		
DVD-R	Z8		
CD	Z9		
TAPE	ZA		
CD-R	ZB		
FM	ZD		
AM	ZE		
MW	ZF		
LW	ZG		
TUNER	ZH		
Not available	Z-		
TUNER FREQUENCY (Multi Room)	'a' ("@1?a",0x0D)	TUNER FREQUENCY XXXX=076.00-108.00(FM) =520-1710(AM,MW) = 152-282(LW)	a0XXXX (FM:87.50 = "8750") (FM:108.00="0800") (MW: 520="0520") (MW:1710="1710")
		Not available	a- ("@1a-",0x0D)
TUNER PRESET (Multi Room)	'b' ("@1?b",0x0D)	Preset No. (XX=01~50) Not Preset mode (XX=00)	b0XX
		Not available	b- ("@1b-",0x0D)
VOLUME Status (Multi Room)	'c' ("@1?c",0x0D)	VOL .XXX(-90~+99)	c0XXX
		MAX.	c1
		MIN.(-∞)	c2
VOLUME SET Status (Multi Room)	'd' ("@1?d",0x0D)	VARIABLE	d0
		FIXED	d1
SLEEP TIMER Status (Multi Room)	'e' ("@1?e",0x0D)	SLEEP OFF	e0
		SLEEP XXX(1~120)	e1XXX
OSD Status (Multi Room)	'f' ("@1?f",0x0D)	MULTI OSD ON	f0
		MULTI OSD OFF	f1
SPEAKER Status (Multi Room)	'g' ("@1?g",0x0D)	MULTI SPEAKER ON	g0
		MULTI SPEAKER OFF	g1
MUTE Status (Multi Room)	'h' ("@1?h",0x0D)	MUTE ON (MR)	h0
		MUTE OFF (MR)	h1

Request Status	Char. & Sample	Status answer	Char. & Sample
CHANNEL LEVEL [XX: (0="10") (+01="11"~+10="20") (-01="09"~ -10="00") (-11="55" ~ -15="51")]	"i0" ("@1?i0", 0x0D)	LEFT LEVEL	i0XX ("@1i010"0x0D)
	"i1" ("@1?i1", 0x0D)	RIGHT LEVEL	i1XX
	"i2" ("@1?i2", 0x0D)	CENTER LEVEL	i2XX
	"i3" ("@1?i3", 0x0D)	SUBWF LEVEL	i3XX
	"i4" ("@1?i4", 0x0D)	SURR L LEVEL	i4XX
	"i5" ("@1?i5", 0x0D)	SURR R LEVEL	i5XX
	"i6" ("@1?i6", 0x0D)	BACK L (or 1ch) LEVEL	i6XX
	"i7" ("@1?i7", 0x0D)	BACK R LEVEL	i7XX
SPEAKER DISTANCE [XX: (00~30) (1 foot = "01") (10 feet="10")]	"j0" ("@1?j0", 0x0D)	LEFT DISTANCE	j0XX
	"j1" ("@1?j1", 0x0D)	RIGHT DISTANCE	j1XX
	"j2" ("@1?j2", 0x0D)	CENTER DISTANCE	j2XX
	"j3" ("@1?j3", 0x0D)	SUBWF DISTANCE	j3XX
	"j4" ("@1?j4", 0x0D)	SURR. L DISTANCE	j4XX
	"j5" ("@1?j5", 0x0D)	SURR. R DISTANCE	j5XX
	"j6" ("@1?j6", 0x0D)	BACK L DISTANCE	j6XX
	"j7" ("@1?j7", 0x0D)	BACK R DISTANCE	j7XX
SPEAKER SIZE	"k0" ("@1?k0", 0x0D)	FRONT LAGE	k00
		FRONT SMALL	k01
	"k1" ("@1?k1", 0x0D)	CENTER LAGE	k10
		CENTER SMALL	k11
		CENTER OFF	k12
	"k2" ("@1?k2", 0x0D)	SUBWF ON	k20
		SUBWF OFF	k22
	"k3" ("@1?k3", 0x0D)	SURR. LAGE	k30
		SURR. SMALL	k31
		SURR. OFF	k32
	"k4" ("@1?k4", 0x0D)	BACK LAGE	k40
		BACK SMALL	k41
BACK OFF		k42	
SPEAKER BACK	"k5" ("@1?l", 0x0D)	BACK 1ch	l0
		BACK 2ch	l1
		BACK NONE	l2

3-5-2. Special Status request and Status answer list

Request Status	Char. & Sample	Status answer	Char. & Sample
SERIAL NUMBER	'n' ("@1?n", 0x0D)	SERIAL NUMBER	"n0XXXXXXXXX" ("@1n0123456789",0x0D)
ERROR DETECT	'm' ("@1?m", 0x0D)	see blow	m0#\$\$%& ("@1m0#\$\$%&",0x0D)
		No error	m- ("@1m-",0x0D)
Descriptions of ERROR DETECT status answer character. (about : #\$\$%&) (Character #, \$, % and & would be '0' to '9' or 'A' to 'F', it uses to as hex. bit data.)			
* # :	Bit ErrorName	ERROR	SAFE
	3 Reserved	1	1
	2 Reserved	0	0
	1 Reserved	0	0
	0 Reserved	0	0
* \$:	Bit ErrorName	ERROR	SAFE
	3 Reserved	0	0
	2 Reserved	0	0
	1 PROTECT	1	0
	0 DSP1 ERROR	1	0
* % :	Bit ErrorName	ERROR	SAFE
	3 Reserved	1	1
	2 DSP2 ERROR	1	0
	1 ADC ERROR	1	0
	0 EEPROM ERROR	1	0
* & :	Bit ErrorName	ERROR	SAFE
	3 EEPROM IF ERROR	1	0
	2 DSP CODE ERROR	1	0
	1 RS232C ERROR	1	0
	0 POWER 5V ERROR	1	0
ex.)			
* If the POWER 5V ERROR only occurs that will send ["@1m08081",0x0D].			
* If the RS232C ERROR only occurs that will send ["@1m08082",0x0D].			
* If the ADC ERROR only occurs that will send ["@1m080A0",0x0D].			
* If the DSP1 ERROR only occurs that will send ["@1m09080",0x0D].			