

# ***SR9600XM***

## ***RS-232C Control Specification***

**Category** : *A/V Receiver*

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## 1. Introduction

### 1-1. Purpose

This document was written as a reference specification of products that are controlled by the host controller.

### 1-2. Scope

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

### 1-3. Abbreviations

Abbreviation	Description

### 1-4. References

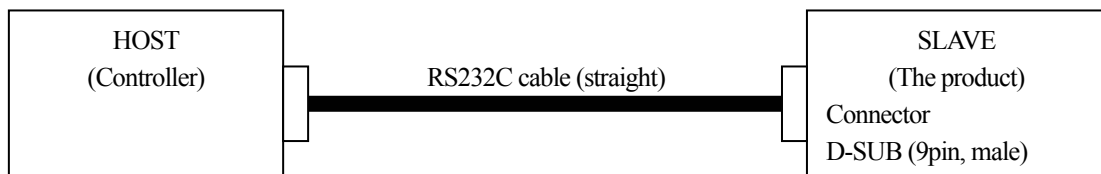
- Hardware Software Interface Specification ver. 1.02 / author: N.Sakamoto
- 

## 2. Global Description

### 2-1. Overview

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

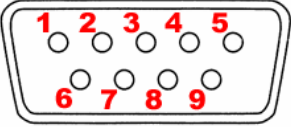
### 2-2. Block Diagram



\* The product connector is using D-SUB 9pin male.

\* RS232C cable must use D-SUB 9pin female to connect the products.

### 2-3. Interface connection specification of the product

uP Interface	Signal name	Connection device	D-Sub Pin	Connector
-	N.C.	-	1	<The product connector> RS232C D-SUB (9pin, <b>Male</b> ) 
UART	TxD (output)	RS232C	2	
	RxD (input)	Level shift driver	3	
-	N.C.	-	4	
-	GND	GND	5	
-	N.C.	-	6	
-	N.C.	-	7	
-	N.C.	-	8	
-	N.C.	-	9	

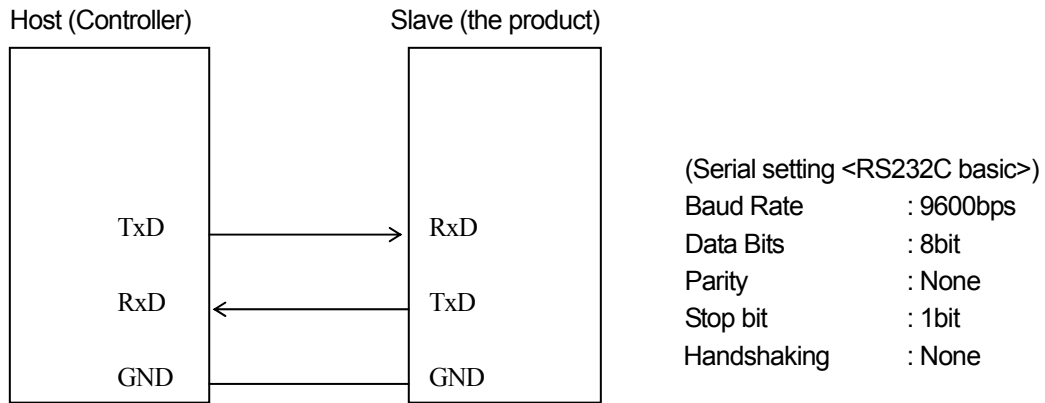
### 2-4. Assumptions and Dependencies

### 3. Detailed Description

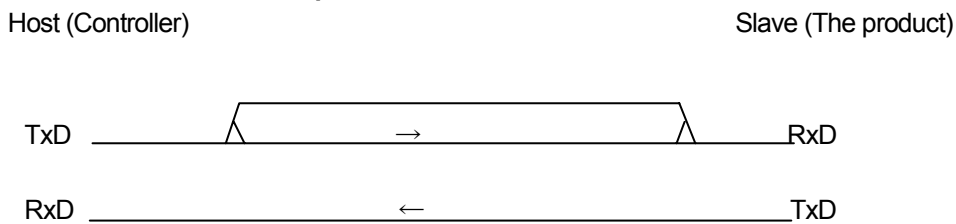
The interface specification between the product and a Host controller is described below.

#### 3-1. Connection format

##### 3-1-1. Physical connection

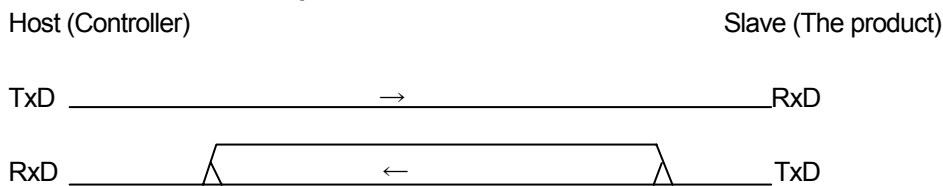


##### 3-1-1-1. Data transmission sequence from Host to Slave



1. Host starts a data transmission from TxD.
2. Host performs the data transmission of the number of required bytes, and ends a transmission.

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



1. Slave starts a data transmission from TxD.
2. Slave performs the data transmission of the number of required bytes, and ends a transmission.

### 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 : '@'  
 COMMAND : see "Command list"  
 End character (CR) : 0Dh

start	command	end
'@'	"xxx:"+"..."	0Dh

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

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

Start character : '@'  
 Request status : see "Status request list"  
 Request character : '?'  
 End character (CR) : 0Dh

start	request status	end
'@'	"xxx:?"+"..."	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 is sent to Host when Slave has no related status by the Command.)

Start character : '@', ACK : 06h, End character (CR) : 0Dh

start	ACK	CR
'@'	06h	0Dh

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

Start character : '@', NAK : 15h, End character (CR) : 0Dh

start	NAK	CR
'@'	15h	0Dh

##### 3-2-2-2. Form2: Status answer and Auto status feedback

Status answers are reply data when Slave got an acceptable Request status or Command data from Host. Auto status feedbacks are send to Host data when a Slave's status is changed.

Start character : '@'  
 Answer character : see "Status list"  
 End character (CR) : 0Dh

start	status	end
'@'	"xxx:"+"..."	0Dh

### 3-3. The transaction sequences and the regulations

#### 3-3-1. The transaction sequences

The transactions have three kinds of sequence.

- \*A transaction is a Command from Host then Slave will be an answer by Status answer, ACK or NAK.
- \*A transaction is a Status request from Host then Slave will be an answer by Status answer or NAK.
- \*A transaction is Auto status feedback from Slave when a Slave's status changed. (If the auto status feedback is enabled.)

#### 3-3-2. The transaction regulations

The transactions have some kinds of regulation.

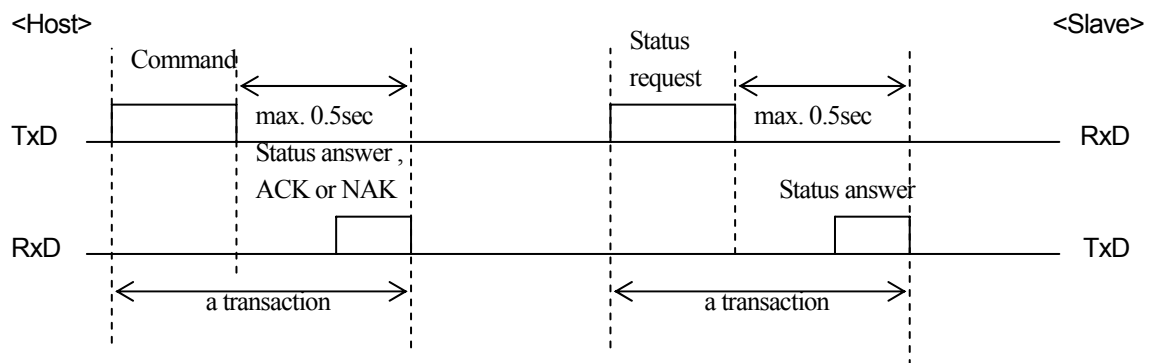
- \* An answer (ACK, NAK or Status answer) transmission by Slave has to finish within 500ms when got a Command or a Status request from Host.
- \* Host must not transmit an another Command or Status request until "it receives a answer by a previous Command or Status request" or "it passes a term of waiting time from a finishing of previous transmission of a Command or a Status request".
- \* Slave has to finish a transaction under 500ms when it sends Auto status feedback data.

#### 3-3-3. Specification of Auto status feedback

There are some specific regulations about Auto status feedback.

- \* The product status has segmented into **four layers of 1, 2, 3 and 4**.
- \* The status of layer 1 are assigned most kindly status to Host. (The statuses of layer 2 are assigned kindly status, the statuses of layer 3 are not so need status to Host and the statuses of layer 4 are probably no wished statuses.)
- \* Each layer status can control transmit enable or disable by Host command. (The product default would be all disables.)
- \* Slave sends auto status feedback by itself when the status is changed and if the status feedback is enabled.
- \* The product defined and segmentated layers are taking in status list.

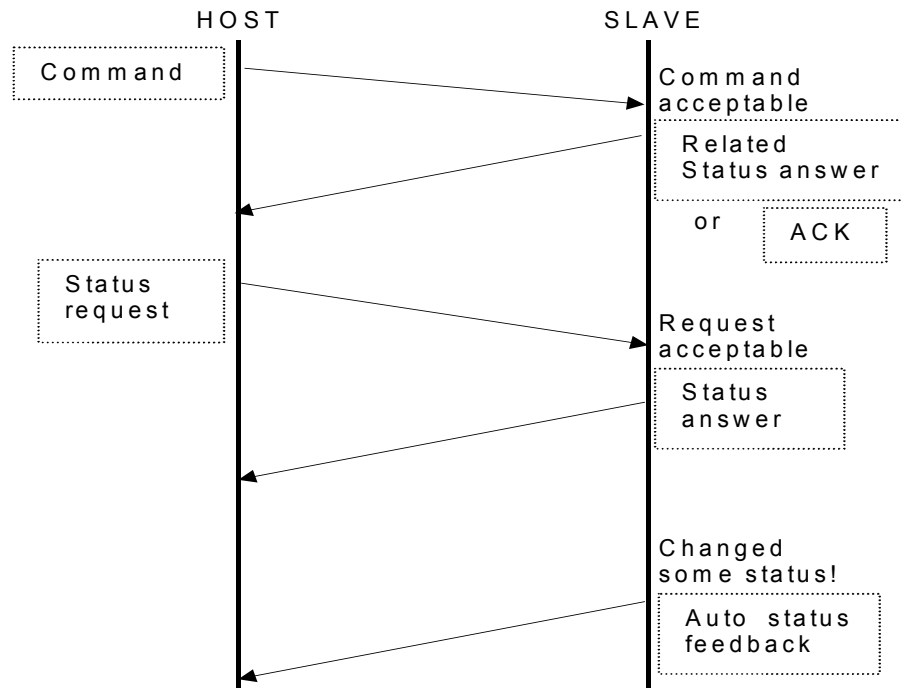
#### 3-3-4. Example of the transactions



Example of the transactions

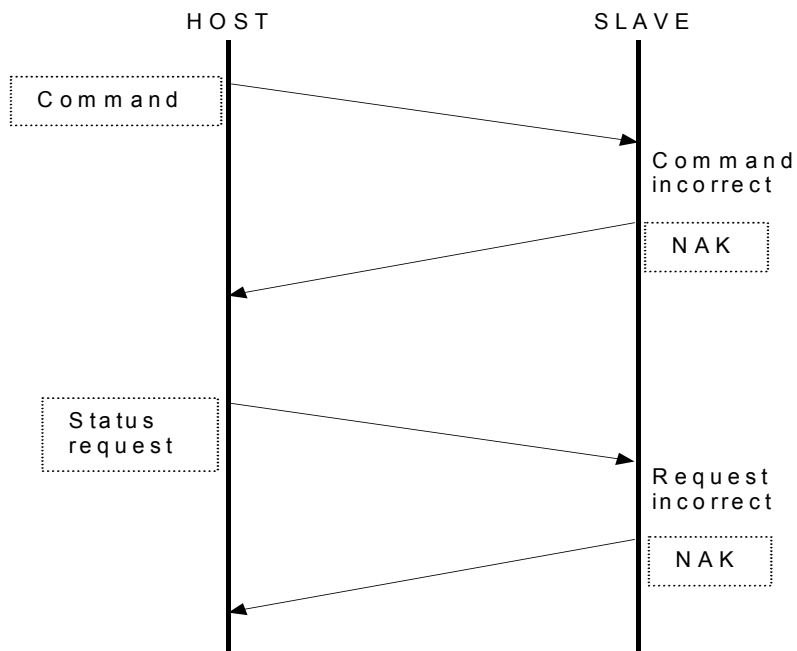
3-3-5. Examples of the handshaking flowchart

3-3-5-1. Example of successful handshaking



The product can reply ACK instead of related status, if the product can not send the related status immediatly.

3-3-5-2. Examples of handshaking error



#### 4. Recommendations of Command, Status and Layer definition

- All Commands, Statuses and Layers will be defined other specific document.
- **[MANDATORY]** The product **MUST** have Commands and the Statuses same as a remote controller buttons (IR controller) of the product.
- All Commands are required working by discrete as ON/OFF commands. (It means that do not support TOGGLE command only.)
- All Commands and Statuses are defined same character size except ACK/NAK on the product. ( Recommended character length : 3~6 characters )
- It permits attaching 0x0A character to a reply characters from the product. In this case, must suppose that the object is followed altogether.
- Recommend to supports numbers or values direct setting command, if it has variable numbers or values.



## 5. Definitions of Command, Status and Layer

This section is told how to define "Command", "Status" and "Layer" of this product.

### 5-1. Commands

This chapter will show the commands of this product.

#### 5-1-1. Normal Command list

Command		Reply from Slave	
POWER	TOGGLE	"PWR:0"	"PWR:1", "PWR:2"
	OFF	"PWR:1"	
	ON	"PWR:2"	
AUDIO ATT	TOGGLE	"ATT:0"	"ATT:0", (None) "ATT:1", (OFF) "ATT:2" (ON)
	OFF	"ATT:1"	
	ON	"ATT:2"	
AUDIO MUTE	TOGGLE	"AMT:0"	"AMT:1", "AMT:2"
	OFF	"AMT:1"	
	ON	"AMT:2"	
VIDEO MUTE	TOGGLE	"VMT:0"	"VMT:1", "VMT:2"
	OFF	"VMT:1"	
	ON	"VMT:2"	
VOLUME	VALUE	"VOL:0xxx"	"VOL:xxx" xxx = vol. value as +18~-80db, y = .0 or .5 db 00.0 = "VOL: 000", -∞ = "VOL:-ZZZ"
	UP	"VOL:1"	
	DOWN	"VOL:2"	
	UP-FAST	"VOL:3"	
	DOWN-FAST	"VOL:4"	
TONE BASS	VALUE	"TOB:0xxx"	"TOB:xxx" xxx = vol. value as +06 ~-06
	UP	"TOB:1"	
	DOWN	"TOB:2"	
TONE TREBLE	VALUE	"TOT:0xxx"	"TOT:xxx" xxx = vol. value as +06 ~-06
	UP	"TOT:1"	
	DOWN	"TOT:2"	
SOURCE Select	TV	"SRC:1"	"SRC:va", (v ,a= '0' ~ 'Z') (v = video, a = audio.) v = 0 (V-OFF) a = N (7.1CH)
	DVD	"SRC:2"	
	VCR1	"SRC:3"	
	VCR2	"SRC:4"	
	DSS	"SRC:5"	
	LD	"SRC:6"	
	AUX1	"SRC:9"	
	AUX2	"SRC:A"	
	CD	"SRC:C"	
	CD-R	"SRC:D"	
	TAPE	"SRC:E"	
	TUNER1	"SRC:F"	
	FM1	"SRC:G"	
	AM1	"SRC:H"	
	TUNER2 / XM	"SRC:J"	
FM2	"SRC:K"		
AM2	"SRC:L"		
7.1 Channel Input	TOGGLE	"71C:0"	"71C:1",(OFF) "71C:2"(ON)
	OFF	"71C:1"	
	ON	"71C:2"	

Command		Reply from Slave	
SPEAKER Select	SPKR SEL	"SPK:0"	"SPK:ab", a=SPK-A,b=SPK-B
	SPKR-A OFF	"SPK:1"	"SPK:11"(A-OFF,B-OFF),
	SPKR-A ON	"SPK:2"	"SPK:21"(A-ON,B-OFF),
	SPKR-B OFF	"SPK:3"	"SPK:12"(A-OFF,B-ON),
	SPKR-B ON	"SPK:4"	"SPK:22"(A-ON,B-ON),

Command		Reply from Slave	
SLEEP	VALUE	"SLP:0xx" (xx="00"~"90")	"SLP:01~90" ( ON ),
	OFF	"SLP:1"	"SLP:00" (OFF)
MENU	TOGGLE	"MNU:0" (work same as RC)	"MNU:1", (Not on Menu) "MNU:2" (On Menu )
	OFF	"MNU:1"	
	ON	"MNU:2"	
	ENTER	"MNU:3"	
CURSOR	UP	"CUR:1"	ACK
	DOWN	"CUR:2"	
	LEFT	"CUR:3"	
	RIGHT	"CUR:4"	

Command		Reply from Slave	
DC TRG.	TRG. 1 OFF	"DCT:11" (DC TRG. 1 OFF)	"DCT:abcd" ( a,b,c,d = 1:OFF, 2:ON), a = TRG.1, b = TRG.2, c = TRG. 3, d = TRG. 4 eg.) "DCT:1111" (all OFF), "DCT:2111" (TRG.1 ON), "DCT:1211" (TRG.2 ON) "DCT:2222" (all ON)
	TRG. 1 ON	"DCT:12" (DC TRG. 1 ON)	
	TRG. 2 OFF	"DCT:21" (DC TRG.2 OFF )	
	TRG. 2 ON	"DCT:22" (DC TRG.2 ON )	
	TRG. 3 OFF	"DCT:31" (DC TRG.3 OFF )	
	TRG. 3 ON	"DCT:32" (DC TRG.3 ON )	
	TRG. 4 OFF	"DCT:41" (DC TRG.4 OFF )	
	TRG. 4 ON	"DCT:42" (DC TRG.4 ON )	

Command		Reply from Slave	
Surr. Mode	AUTO	"SUR:00"	see Surr. Mode Status
	STEREO	"SUR:01"	
	DOLBY	"SUR:02"	
	PL II (x) MOVIE	"SUR:03"	
	-		
	PL II (x) MUSIC	"SUR:05"	
	-		
	PL II (x) GAME	"SUR:07"	
	-		
	-		
	EX/ES	"SUR:0A"	
	DTS ES	"SUR:0E"	
	NEO6 CINEMA	"SUR:0F"	
	NEO6 MUSIC	"SUR:0G"	
	Multi Ch. STEREO	"SUR:0H"	
	CS II CINEMA	"SUR:0I"	
	CS II MUSIC	"SUR:0J"	
	CS II MONO	"SUR:0K"	
	VIRTUAL	"SUR:0L"	
	DTS	"SUR:0M"	
	-		
	DD+ PL II x MOVIE	"SUR:0O"	
	DD+ PL II x MUSIC	"SUR:0P"	
	-	"SUR:0S"	
	SOURCE DIRECT	"SUR:0T"	
	PURE DIRECT	"SUR:0U"	
	-	"SUR:0X"	
	-	"SUR:0Y"	
NEXT	"SUR:1"		
PREV	"SUR:2"		

Command		Reply from Slave	
THX	THX TOGGLE	"THX:0"	THX AUTO "THX:0"
	THX OFF	"THX:1"	THX+DOLBY DIGITAL "THX:2"
	THX ON	"THX:2"	THX+PL II x MOVIE "THX:3"
	THX EX	"THX:3"	THX+PL II MOVIE "THX:4"
	THX ULTRA	"THX:4"	THX+EX/ES "THX:A"
	THX CINEMA	"THX:5"	THX EX+DD "THX:C"
	THX GAMES	"THX:6"	THX+DTS ES "THX:E"
	THX MUSIC	"THX:7"	THX+NEO6 CINEMA "THX:F"
			THX+DTS "THX:M"
			THX+DD+PL II x "THX:O"
			THX+AAC+PL II x "THX:Q"
			THX+AAC "THX:S"
			THX EX+AAC "THX:V"
			THX +ULTRA2 "THX:Z"
			THX 5.1 "THX:a"
			THX MUSIC "THX:b"
			THX GAMES "THX:c"
			2.0 THX GAMES "THX:d"
			THX CINEMA "THX:e"
			"SUR:x" (x = '0'~'Z')

Command			Reply from Slave
Dolby Headphone Mode	BYPASS	"DHM:0"	"DHM:x" x = Dolby Headphone mode
	DH1	"DHM:1"	
		"DHM:2" (+PL II MOVIE)	
		"DHM:3" (+PL II MUSIC)	
	DH2	"DHM:4"	
		"DHM:5" (+PL II MOVIE)	
		"DHM:6" (+PL II MUSIC)	
	DH3	"DHM:7"	
		"DHM:8" (+PL II MOVIE)	
"DHM:9" (+PL II MUSIC)			

Command			Reply from Slave
NIGHT MODE	TOGGLE	"NGT:0"	"NGT:0", (invalid)
	OFF	"NGT:1"	"NGT:1", (OFF)
	ON	"NGT:2"	"NGT:2" (ON)
Lip Sync.	VALUE	"LIP:0xxx" (xxx = value ms)	"LIP:xxx", (xxx = value ms)
	UP	"LIP:1" (up 10ms)	xxx = "000" (OFF)
	DOWN	"LIP:2" (down 10ms)	xxx = "010" ~ "200" (ON)
Test Tone (Force start/stop Test Tone with Auto mode)	TOGGLE	"TTO:0"	"TTO:1xy" (OFF), "TTO:2xy" (ON) (x= auto(0)/manual(1), y= ch.)
	OFF	"TTO:1"	
	ON	"TTO:2"	
	NEXT	"TTO:3"	
	PREV	"TTO:4"	

Command			Reply from Slave
Tuner1 Frequency	VALUE	"TFQ:0xxxxx" (xxxxx = freq.)	"TFQ:xxxxx" xxxxx<02000 :xxx.xx kHz (AM) 01999<xxxxx :xxx.xx MHz (FM)
	UP	"TFQ:1"	
	DOWN	"TFQ:2"	
	Auto-UP	"TFQ:3"	
	Auto-DOWN	"TFQ:4"	
Tuner1 Preset	VALUE	"TPR:0ww"	"TPR:ww" (ww = current preset nr.) (ww = 01 ~ ??)
	UP	"TPR:1"	
	DOWN	"TPR:2"	
	P-Scan start	"TPR:3"	
	P-Scan stop	"TPR:4"	
Tuner1 mode	TOGGLE	"TMD:0"	"TMD:0" (-), "TMD:1" (MONO), "TMD:2" (AUTO)
	OFF(MONO)	"TMD:1"	
	ON(AUTO)	"TMD:2"	
Tuner Preset Info.	TOGGLE	"TPI:0"	"TPI:1" (OFF), "TPI:2" (ON)
	OFF	"TPI:1"	
	ON	"TPI:2"	
Tuner1 MEMO	-	"MEM:0"	ACK
Tuner1 CLEAR	-	"CLR:0"	ACK

Command		Reply from Slave	
XM Display mode	TOGGLE	"XDP:0"	"XDP:1"(SONG) "XDP:2"(CATEGORY) "XDP:3"(STATUS) "XDP:4"(OSD)
	SONG	"XDP:1"	
	CATEGORY	"XDP:2"	
	STATUS	"XDP:3"	
	OSD	"XDP:4"	
XM Category Search	VALUE	"CAT:0xx"	"CAT:yxx" y = 1(un search), 2(in search) xx= Category No. 00(none), 01 to 32
	CH. UP	"CAT:1"	
	CH. DOWN	"CAT:2"	
	CAT. NEXT	"CAT:3"	
	CAT. PREV	"CAT:4"	

Command		Reply from Slave	
Tuner2 / XM Frequency	VALUE	"TFQ*0xxxxx" (xxxxx = freq.)	"TFQ*xxxxx" xxxxx<00256 :ChNo.xxxxx (XM)
	UP	"TFQ*1"	
	DOWN	"TFQ*2"	
Tuner2 / XM Preset	VALUE	"TPR*0ww"	"TPR*ww" (ww = current preset nr.) (ww = 01 ~ ??)
	UP	"TPR*1"	
	DOWN	"TPR*2"	
	P-Scan start	"TPR*3"	
	P-Scan stop	"TPR*4"	
Tuner2 MEMO	-	"MEM*0"	ACK
Tuner2 CLEAR	-	"CLR*0"	ACK

		Command		Reply from Slave
Multi Room A POWER	TOGGLE	"MPW:0"		"MPW:1", (OFF) "MPW:2" (ON)
	OFF	"MPW:1"		
	ON	"MPW:2"		
Multi Room A SPEAKER	TOGGLE	"MSP:0"		"MSP:1", (OFF) "MSP:2" (ON)
	OFF	"MSP:1"		
	ON	"MSP:2"		
Multi Room A AUDIO MUTE	TOGGLE	"MAM:0"		"MAM:1", "MAM:2"
	OFF	"MAM:1"		
	ON	"MAM:2"		
Multi Room A VOLUME	VALUE	"MVL:0xxx"		"MVL:xxx" xxx = vol. value as "00" ~"-90"
	UP	"MVL:1"		
	DOWN	"MVL:2"		
Multi Room A VOLUME SET	VARIABLE	"MVS:1"		"MVS:1", ( VARIABLE) "MVS:2" (FIXED)
	FIXED	"MVS:2"		
Multi Room A SOURCE Select	TV	"MSC:1"		"MSC:va", (v ,a= '0' - 'Z') (v = video, a = audio.)
	DVD	"MSC:2"		
	VCR1	"MSC:3"		
	VCR2	"MSC:4"		
	DSS	"MSC:5"		
	LD	"MSC:6"		
	AUX1	"MSC:9"		
	AUX2	"MSC:A"		
	CD	"MSC:C"		
	CD-R	"MSC:D"		
	TAPE	"MSC:E"		
	TUNER1	"MSC:F"		
	FM1	"MSC:G"		
	AM1	"MSC:H"		
	TUNER2 / XM	"MSC:J"		
FM2	"MSC:K"			
AM2	"MSC:L"			
Multi Room A SLEEP	VALUE	"MSL:0xx" ("xx" = min)		"MSL:xx" (xx = min) "MSL:00"
	OFF	"MSL:1"		
Multi Room A Tuner1 Frequency	VALUE	"MTF:0xxxxx" (xxxxx = freq.)		"MTF:xxxxx" xxxxx<02000 :xxx.xx kHz (AM) 01999<xxxxx :xxx.xx MHz (FM)
	UP	"MTF:1"		
	DOWN	"MTF:2"		
	Auto-UP	"MTF:3"		
	Auto-DOWN	"MTF:4"		
Multi Room A Tuner1 Preset	VALUE	"MTP:0ww" (ww = preset nr.)		"MTP:ww" (ww = current preset nr.) (ww = 01 ~??)
	UP	"MTP:1"		
	DOWN	"MTP:2"		
	SCAN Start	"MTP:3"		
	SCAN Stop	"MTP:4"		
Multi Room A Tuner1 mode	TOGGLE	"MTM:0"		"MTM:0" (-), "MTM:1"(MONO), "MTM:2"(AUTO)
	OFF(MONO)	"MTM:1"		
	ON(AUTO)	"MTM:2"		

	Command		Reply from Slave
Multi Room A Tuner2 / XM Frequency	VALUE	"MTF*0xxxxx" (xxxxx = freq.)	"MTF*xxxxx" xxxxx<00256 :ChNo.xxxxx (XM)
	UP	"MTF*1"	
	DOWN	"MTF*2"	
Multi Room A Tuner2 / XM Preset	VALUE	"MTP*0ww" (ww = preset nr.)	"MTP*ww" (ww = current preset nr.) (ww = 01 ~??)
	UP	"MTP*1"	
	DOWN	"MTP*2"	
	SCAN Start	"MTP*3"	
	SCAN Stop	"MTP*4"	

		Command		Reply from Slave
Multi Room B POWER	TOGGLE	"MPW=0"		"MPW=1", (OFF) "MPW=2" (ON)
	OFF	"MPW=1"		
	ON	"MPW=2"		
Multi Room B SPEAKER	TOGGLE	"MSP=0"		"MSP=1", (OFF) "MSP=2" (ON)
	OFF	"MSP=1"		
	ON	"MSP=2"		
Multi Room B AUDIO MUTE	TOGGLE	"MAM=0"		"MAM=1", "MAM=2"
	OFF	"MAM=1"		
	ON	"MAM=2"		
Multi Room B VOLUME	VALUE	"MVL=0xxx"		"MVL=xxx" xxx = vol. value as "00" ~"-90"
	UP	"MVL=1"		
	DOWN	"MVL=2"		
Multi Room B VOLUME SET	VARIABLE	"MVS=1"		"MVS=1", ( VARIABLE) "MVS=2" (FIXED)
	FIXED	"MVS=2"		
Multi Room B SOURCE Select	TV	"MSC=1"		"MSC=va", (v ,a= '0' - 'Z') (v = video, a = audio.)
	DVD	"MSC=2"		
	VCR1	"MSC=3"		
	VCR2	"MSC=4"		
	DSS	"MSC=5"		
	LD	"MSC=6"		
	AUX1	"MSC=9"		
	AUX2	"MSC=A"		
	CD	"MSC=C"		
	CD-R	"MSC=D"		
	TAPE	"MSC=E"		
	TUNER1	"MSC=F"		
	FM1	"MSC=G"		
	AM1	"MSC=H"		
	TUNER2 / XM	"MSC=J"		
FM2	"MSC=K"			
AM2	"MSC=L"			
Multi Room B SLEEP	VALUE	"MSL=0xx" ("xx" = min)		"MSL=xx" (xx = min) "MSL=00"
	OFF	"MSL=1"		
Multi Room B Tuner1 Frequency	VALUE	"MTF=0xxxxx" (xxxxx = freq.)		"MTF=xxxxx" xxxxx<00256 :ChNo.xxxxx (XM) xxxxx<02000 :xxx.xx kHz (AM) 01999<xxxxx :xxx.xx MHz (FM)
	UP	"MTF=1"		
	DOWN	"MTF=2"		
	Auto-UP	"MTF=3"		
	Auto-DOWN	"MTF=4"		
Multi Room B Tuner1 Preset	VALUE	"MTP=0ww" (ww = preset nr.)		"MTP=ww" (ww = current preset nr.) (ww = 01 ~??)
	UP	"MTP=1"		
	DOWN	"MTP=2"		
	SCAN Start	"MTP=3"		
	SCAN Stop	"MTP=4"		
Multi Room B Tuner1 mode	TOGGLE	"MTM=0"		"MTM=0"(-), "MTM=1"(MONO), "MTM=2"(AUTO)
	OFF(MONO)	"MTM=1"		
	ON(AUTO)	"MTM=2"		



Command		Reply from Slave
Multi Room B Tuner2 / XM Frequency	VALUE	"MTF#0xxxxx" (xxxxx = freq.)
	UP	"MTF#1"
	DOWN	"MTF#2"
Multi Room B Tuner2 / XM Preset	VALUE	"MTP#0ww" (ww = preset nr.)
	UP	"MTP#1"
	DOWN	"MTP#2"
	SCAN Start	"MTP#3"
	SCAN Stop	"MTP#4"
		"MTF#xxxxx" xxxxx<00256 :ChNo.xxxxx (XM)
		"MTP#ww" (ww = current preset nr.) (ww = 01 ~??)

### 5-1-2. Specific Commands

Command from Host	Reply from Slave
Auto status feedback  (The product default is disabled all auto status feedback.)	"AST:x" (x = '0' ~ 'F')  bit 3 : Layer 4 ( 1 = Enable, 0 = Disable) bit 2 : Layer 3 ( 1 = Enable, 0 = Disable) bit 1 : Layer 2 ( 1 = Enable, 0 = Disable) bit 0 : Layer 1 ( 1 = Enable, 0 = Disable)
	same as command define

## 5-2. Status request and Status answer list

### 5-2-1. Normal Status request and Status (answer and feedback) list

Status request		Status answer and feedback	
POWER	"PWR:?"	OFF	"PWR:1"
		ON	"PWR:2"
AUDIO ATT	"ATT:?"	OFF	"ATT:1"
		ON	"ATT:2"
AUDIO MUTE	"AMT:?"	OFF	"AMT:1"
		ON	"AMT:2"
VIDEO MUTE	"VMT:?"	OFF	"VMT:1"
		ON	"VMT:2"
VOLUME	"VOL:?"	Volume value = xxxy (see command list)	"VOL:xxxy" (+18.0 ~ -80.0dB)
TONE BASS	"TOB:?"	Bass value = xxx (see command list)	"TOB:xxx"
TONE TREBLE	"TOT:?"	Treble value = xxx (see Command List)	"TOT:xxx"
SOURCE Select	"SRC:?"	Video+Audio source (see Command List)	"SRC:va" (v ,a= '0' ~ 'Z') (v = video, a = audio.)
7.1 Channel Input	"71C:?"	OFF	"71C:1"
		ON	"71C:2"
INPUT SIGNAL	"ISG:?"	ANALOG	"ISG:1"
		DIGITAL	"ISG:2"
		iLINK	"ISG:3"
		HDMI	"ISG:4"
SPEAKER Select	"SPK:?"	Speaker status = ab a = SPKR-A, b = SPKR-B	"SPK:ab" a,b (1 = OFF, 2 = ON)

Status request		Status answer and feedback	
SLEEP	"SLP:?"	Sleep time (xx = 00 ~ 90)	"SLP:xx"
MENU	"MNU:?"	OFF	"MNU:1" ( Not on Menu)
		ON	"MNU:2" (On Menu)

Status request		Status answer and feedback	
DC TRG.	"DCT:?"	"DCT:abcd" (1 = OFF, 2 = ON) ( a = TRG.1, b = TRG.2, c = TRG.3, d = TRG4 )	eg.) "DCT:1111", (all OFF) "DCT:1211", (TRG.2 ON) "DCT:2222" (all ON)

Status request		Status answer and feedback	
Surr. Mode	"SUR:?"	"SUR:x" , "THX:x"	same as command replay (see Command list)
THX	"THX:?"	"SUR:x" , "THX:x",	same as command replay (see Command list)
Dolby Headphone mode	"DHM:?"	"DHM:x"	same as command replay (see Command list)
Night Mode	"NGT:?"	OFF	"NGT:1"
		ON	"NGT:2"
Lip Sync.	"LIP:?"	VALUE (ms)	"LIP:xxx" (xxx = 000 ~ 200 ms)

Status request		Status answer and feedback	
Digital Signal Format	"SIG:?"	x = '0' :No detect '1' :D DIGITAL AC-3 '2' : D DIGITAL AC-3 PL '3' : D DIGITAL SURR. EX '4' : DTS '5' : DTS ES DISCRETE '6' : DTS ES MATRIX '7' : AAC '8' : MPEG '9' : M-PCM 'A' : PCM 'B' : HDCD 'C' : DSD 'D' : DTS 96/24 'E' : reserved 'F' : OTHER	"SIG:x" x = signal

Status request		Status answer and feedback	
Tuner1 Frequency	"TFQ:?"	"TFQ:xxxxx"	same as command reply (see Command list)
Tuner1 Preset	"TPR:?"	"TPR:ww"	same as command reply (see Command list)
Tuner1 mode	"TMD:?"	OFF ( MONO)	"TMD:1"
		AUTO	"TMD:2"
Tuner Preset Info.	"TPI:?"	OFF	"TPI:1"
		ON	"TPI:2"

Status request		Status answer and feedback	
Tuner2 Frequency	"TFQ*?"	"TFQ*xxxxx"	same as command reply (see Command list)
Tuner2 Preset	"TPR*?"	"TPR*ww"	same as command reply (see Command list)

Status request		Status answer and feedback	
Multi Room A POWER	"MPW:?"	OFF	"MPW:1"
		ON	"MPW:2"
Multi Room A SPEAKER	"MSP:?"	OFF	"MSP:1"
		ON	"MSP:2"
Multi Room A AUDIO MUTE	"MAM:?"	OFF	"MAM:1"
		ON	"MAM:2"
Multi Room A VOLUME	"MVL:?"	Volume value = xxx	"MVL:xxx"
Multi Room A VOLUME SET	"MVS:?"	VARIABLE	"MVS:1"
		FIXED	"MVS:2"
Multi Room A SOURCE Select	"MSC:?"	Video+Audio source (v ,a= '0' – 'Z') (v = video, a = audio.)	"MSC:va"
Multi Room A SLEEP	"MSL:?"	Sleep time min : xx = '00' ~ '99'	"MSL:xx"

Status request		Status answer and feedback	
Multi Room A Tuner1 Frequency	"MTF:?"	xxxxx = frequency if (xxxxx < 02000) band=AM; else band=FM;	"MTF:xxxxx"
Multi Room A Tuner1 Preset	"MTP:?"	xx = preset number ( 01 ~ ??)	"MTP:xx"
Multi Room A Tuner1 Mode	"MTM:?"	- (None)	"MTM:0"
		OFF (MONO)	"MTM:1"
		ON (AUTO)	"MTM:2"

Status request		Status answer and feedback	
Multi Room A Tuner2 Frequency	"MTF*?"	xxxxx = frequency	"MTF*xxxxx"
Multi Room A Tuner2 Preset	"MTP*?"	xx = preset number ( 01 ~ ??)	"MTP*xx"

Status request		Status answer and feedback	
Multi Room B POWER	"MPW=?"	OFF	"MPW=1"
		ON	"MPW=2"
Multi Room B SPEAKER	"MSP=?"	OFF	"MSP=1"
		ON	"MSP=2"
Multi Room B AUDIO MUTE	"MAM=?"	OFF	"MAM=1"
		ON	"MAM=2"
Multi Room B VOLUME	"MVL=?"	Volume value = xxx	"MVL=xxx"
Multi Room B VOLUME SET	"MVS=?"	VARIABLE	"MVS=1"
		FIXED	"MVS=2"
Multi Room B SOURCE Select	"MSC=?"	Video+Audio source (v ,a= '0' - 'Z') (v = video, a = audio.)	"MSC=va"
Multi Room B SLEEP	"MSL=?"	Sleep time min : xx = '00' ~ '99'	"MSL=xx"

Status request		Status answer and feedback	
Multi Room B Tuner1 Frequency	"MTF=?"	xxxxx = frequency if (xxxxx < 02000) band=AM; else band=FM;	"MTF=xxxxx"
Multi Room B Tuner1 Preset	"MTP=?"	xx = preset number ( 01 ~ ??)	"MTP=xx"
Multi Room B Tuner1 Mode	"MTM=?"	- (None)	"MTM=0"
		OFF (MONO)	"MTM=1"
		ON (AUTO)	"MTM=2"

Status request		Status answer and feedback	
Multi Room B Tuner2 Frequency	"MTF#?"	xxxxx = frequency	"MTF#xxxxx"
Multi Room B Tuner2 Preset	"MTP#?"	xx = preset number ( 01 ~ ??)	"MTP#xx"

Status request		Status answer and feedback	
XM Category Search	"CAT:?"	Un Category Search	"CAT:1xx" xx = Category no, 01~32(00=None)
		In Category Search	"CAT:2xx" xx = Category no, 01~32(00=None)
XM Channel Name	"CHN:?"	Channel name 10 char.	"CHN:xxxxxxxxx" xxxx... = name 10bytes CH0: Radio ID(8bytes)
XM Artist Name	"ARN:?"	Artist name 16 char.	"ARN:xxxx..." xxxx... = name 16bytes
XM Song Title(Name )	"SON:?"	Song name 16 char.	"SON:xxxx..." xxxx... = name 16bytes
XM Signal Status	"SST:?"	(No XM Selected)	"SST:0"
		NO	"SST:1"
		WEAK	"SST:2"
		MARGINAL	"SST:3"
		STRONG	"SST:4"
		CHECK ANTENNA	"SST:5"

## 5-2-2. Layer of the statuses

Status		Layer
POWER	"PWR:"	1
AUDIO ATT	"ATT:"	3
AUDIO MUTE	"AMT:"	1
VIDEO MUTE	"VMT:"	1
VOLUME	"VOL:"	1
TONE BASS	"TOB:"	1
TONE TREBLE	"TOT:"	1
SOURCE Select	"SRC:"	1
7.1 Channel Input	"71C:"	1
INPUT SIGNAL SOURCE	"ISG:"	3
SPEAKER Select	"SPK:"	1

Status		Layer
SLEEP	"SLP:"	2
MENU	"MNU:"	4
DC TRIG.	"DCT:"	1

Status		Layer
Surr. Mode	"SUR:"	2
THX	"THX:"	2
Dolby Headphone Mode	"DHM:"	2
Night Mode	"NGT:"	3
Lip Sync.	"LIP:"	4
Test Tone	"TTO:"	1
Ch.Select	"CSL:"	4
Digital Signal Format	"SIG:"	4

Status		Layer
Tuner1 Frequency	"TFQ:"	3
Tuner1 Preset	"TPR:"	2
Tuner1 mode	"TMD:"	2
Tuner Preset Info.	"TPI:"	2
Tuner2 Frequency	"TFQ*"	3
Tuner2 Preset	"TPR*"	2

Status		Layer
XM Display mode	"XDP:"	1
XM Category Search	"CAT:"	1
XM Channel Name	"CHN:"	4(read only)
XM Artist Name	"ARN:"	4(read only)
XM Song Title	"SON:"	4(read only)
XM Signal Status	"SST:"	1(read only)

Status		Layer
Multi Room A POWER	"MPW:"	1
Multi Room A SPEAKER	"MSP:"	2
Multi Room A AUDIO MUTE	"MAM:"	1
Multi Room A VOLUME	"MVL:"	1
Multi Room A VOLUME SET	"MVS:"	2
Multi Room A SOURCE Select	"MSC:"	1
Multi Room A SLEEP	"MSL:"	2

Status		Layer
Multi Room A Tuner1 Frequency	"MTF:"	3
Multi Room A Tuner1 Preset	"MPR:"	2
Multi Room A Tuner1 Mode	"MTM:"	2

Status		Layer
Multi Room A Tuner2 Frequency	"MTF*"	3
Multi Room A Tuner2 Preset	"MPR*"	2

Status		Layer
Multi Room B POWER	"MPW="	1
Multi Room B SPEAKER	"MSP="	2
Multi Room B AUDIO MUTE	"MAM="	1
Multi Room B VOLUME	"MVL="	1
Multi Room B VOLUME SET	"MVS="	2
Multi Room B SOURCE Select	"MSC="	1
Multi Room B SLEEP	"MSL="	2

Status		Layer
Multi Room B Tuner1 Frequency	"MTF="	3
Multi Room B Tuner1 Preset	"MPR="	2
Multi Room B Tuner1 Mode	"MTM="	2

Status		Layer
Multi Room B Tuner2 Frequency	"MTF#"	3
Multi Room B Tuner2 Preset	"MPR#"	2

**6. Revision history**

Ver.	Date	Owner	Change description
1.0	08/18/06	Marantz America, Inc.	Issued Revision1.0