



Home Theater Standard 7.1

Surround

Preamp/Processor

**RS-232 Port: Sending Commands
and Interpreting Data**

RC-5 Remote: Commands

Developer's Reference

Home Theater Standard 7.1
Surround Preamp/Processor
Developer's Reference
v 03.0

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INFORMATION

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Overview

This document is designed for application developers who want to control the Home Theater Standard 7.1 using an external computer-based device. The document contains five sections:

- 1 Connecting to the RS-232 Port, including the RS-232 connector diagram, and RS-232 Port Protocols, *on page 4*
- 2 RS-232 Commands, *on page 5*
- 3 RS-232 Status Feedback Description, *on page 11*
- 4 RS-232 Status Block Descriptions, showing how the Home Theater Standard 7.1 reports operational status, *on page 11*
- 5 RC-5 Commands, describing the codes used for controlling the Home Theater Standard 7.1 via IR, *on page 18.*

Connecting to the RS-232 Port

A 9-pin RS-232 port is located on the right-hand side of the Home Theater Standard 7.1 back panel. Make sure the clamping screws (or thumbscrews) securely fasten the connection cable from the external computer-based device to the RS-232 port on the Home Theater Standard 7.1.

Refer to the operating manual of your external computer-based device for instructions on connecting to the Home Theater Standard 7.1.

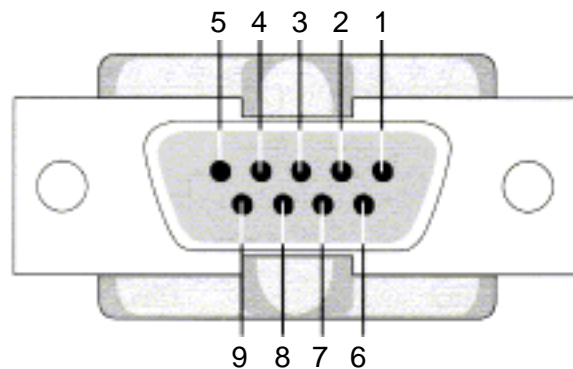
WIRING THE MALE RS-232 PORT CONNECTOR

To wire the male connector, follow these steps:

1. Locate the pin numbers on the male connector plug (not shown).
2. Locate the pinout numbers on the female connector. (See Pinout Signal list below).
3. Wire the male connector, matching the pin numbers on the connector plug to the pinout numbers on the female connector. Only three signals are necessary: 2=Received Data, 3=Transmitted Data, and 5=Signal Ground.

RS-232 PORT FEMALE CONNECTOR

(located on the back panel
of the Home Theater Standard 7.1)



Pinout Signal

| | |
|---|---------------------|
| 1 | Data Carrier Detect |
| 2 | Received Data |
| 3 | Transmitted Data |
| 4 | Data Terminal Ready |
| 5 | Signal Ground |
| 6 | Data Set Ready |
| 7 | Request to Send |
| 8 | Clear to Send |
| 9 | Ring Indicator |

RS-232 Port Protocols

The Home Theater Standard 7.1 RS-232 connection port is set to the following protocols:

9600 Baud 8 Data Bits 1 Stop Bit No Parity

RS-232 Commands for the Home Theater Standard 7.1

| | COMMAND | RS-232 CODE |
|--------------------------|----------|-------------|
| MENU COMMANDS | Up | UPZ |
| | Down | DWNZ |
| | Left | LFTZ |
| | Right | RGTZ |
| | Menu | MENZ |
| | Enter | ENTZ |
| | Previous | PRVZ |

| | | |
|---------------------------------|---------------------|-------|
| AUTO-STATUS COMMANDS | Disable Auto Status | ASTDZ |
| | Enable Auto Status | ASTEZ |
| | Get Status | STAZ |

| | | |
|---|--------------------------------------|------|
| GENERAL DEVICE SELECT COMMANDS | DVD Device Select ¹ | DVDZ |
| | LD Device Select ¹ | LDZ |
| | Satellite Device Select ¹ | SATZ |
| | VCR Device Select ¹ | VCRZ |
| | TV Device Select ¹ | TVZ |
| | CD Device Select ¹ | CDZ |
| | Tuner Device Select ¹ | TUNZ |
| | Aux1 Device Select ¹ | AU1Z |
| | Aux 2 Device Select ¹ | AU2Z |
| | Tape Monitor Select ¹ | TPZ |

| | | | |
|---------------------------|-----------------------------|--|---------|
| LEVEL COMMANDS | Up | UPZ | |
| | Down | DWNZ | |
| | Main Speaker Volume | 000 - 152 | XXXMVLZ |
| | Zone 2 Speaker Volume | 000 - 152 | XXXRVLZ |
| | Center Trim Select | then use UPZ and DWNZ must be on main zone | ICVLZ |
| | Surround Trim Select | then use UPZ and DWNZ send twice for Back Trim Select must be on main zone | IRVLZ |
| | Sub Trim Select | then use UPZ and DWNZ must be on main zone | ISUBZ |
| | Center Speaker Trim | 000 - 020, sets -10 to +10 dB | XXXCVLZ |
| | Surround Speaker Trim | 000 - 020, sets -10 to +10 dB | XXXSRLZ |
| | Back Speaker Trim | 000 - 020, sets -10 to +10 dB | XXXBVLZ |
| | Subwoofer Trim | 000 - 020, sets -10 to +10 dB | XXXSVLZ |
| | Current Zone Balance Select | then use UPZ and DWNZ | IBALZ |
| | Balance | 000 -026, sets right off, left +6, through right +6, left off 1/2 dB steps | XXBALZ |
| | Zone 2 Balance | then use UPZ and DWNZ | BRLZ |

¹ The General Device Select Command is the best choice for normal operation: It always functions on the currently selected zone and engages any configurations set through the Home Theater Standard 7.1 menu.

RS-232 Commands for the Home Theater Standard 7.1, continued

| | COMMAND | RS-232 CODE |
|--|---|-------------|
| Level Commands, continued | Mute Current Zone | MUTZ |
| | Mute Main Zone | MUTMZ |
| | Mute Zone 2 | MUTRZ |
| | Night Compression | NTCZ |
| | Normal Compression | NMCZ |
| | Max Compression | MXCZ |
| GENERIC ZONE DIRECT SELECT COMMANDS (Works on current zone) | 7.1 Input select ² | AMCZ |
| | Analog Audio Input-1 ² | AS1Z |
| | Analog Audio Input-2 ² | AS2Z |
| | Analog Audio Input-3 ² | AS3Z |
| | Analog Audio Input-4 ² | AS4Z |
| | Analog Audio Input-5 ² | AS5Z |
| | Analog Audio Input-6 ² | AS6Z |
| | Analog Audio Input-7 ² | AS7Z |
| | Analog Balanced Input ² | AB1Z |
| | Analog Tape Select ² | ATPAZ |
| | Analog VCR Select ² | AVCAZ |
| | Coax-1 Digital Audio Input Select ² | CO1Z |
| | Coax-2 Digital Audio Input Select ² | CO2Z |
| | Coax-3 Digital Audio Input Select ² | CO3Z |
| | Coax-4 Digital Audio Input Select ² | CO4Z |
| | Coax-5 Digital Audio Input Select ² | CO5Z |
| | Coax-6 Digital Audio Input Select ² | CO6Z |
| | Optical-1 Digital Audio Input Select ² | OPT1Z |
| | Optical-2 Digital Audio Input Select ² | OPT2Z |
| | Component Video-1 ² | CM1Z |
| | Component Video-2 ² | CM2Z |
| | Composite Video-1 ² | CS1Z |
| | Composite Video-2 ² | CS2Z |
| | Composite Video-3 ² | CS3Z |
| | Composite Video-4 ² | CS4Z |
| | S-Video-1 ² | SV1Z |
| | S-Video-2 ² | SV2Z |
| S-Video-3 ² | SV3Z | |
| S-Video-4 ² | SV4Z | |

Note

It is best to use the Home Theater Standard 7.1 on-screen configuration menus, not the Generic Direct Select Command, to configure a particular device. Please see the Home Theater Standard 7.1 Owner's Reference for configuration details.

² Direct Select Commands override the configurations set through the Home Theater Standard 7.1 configuration menus.

RS-232 Commands for the Home Theater Standard 7.1, continued

| | COMMAND | RS-232 CODE |
|--|------------------------------|-------------|
| MAIN ZONE DIRECT SELECT COMMANDS (Main zone must be on) | Main Analog Audio Input-1 | AS1MZ |
| | Main Analog Audio Input-2 | AS2MZ |
| | Main Analog Audio Input-3 | AS3MZ |
| | Main Analog Audio Input-4 | AS4MZ |
| | Main Analog Audio Input-5 | AS5MZ |
| | Main Analog Audio Input-6 | AS6MZ |
| | Main Analog Audio Input-7 | AS7MZ |
| | Main Analog Balanced Input | AB1MZ |
| | Main Analog Tape Select | TPAMZ |
| | Main Analog VCR Select | VCAMZ |
| | Main Aux1 Device Select | AU1MZ |
| | Main Aux2 Device Select | AU2MZ |
| | Main CD Device Select | CDMZ |
| | Main DVD Device Select | DVDMZ |
| | Main LD Device Select | LDMZ |
| | Main Satellite Device Select | SATMZ |
| | Main Tape Device Select | TPMZ |
| | Main Tuner Device Select | TUNMZ |
| | Main TV Device Select | TVMZ |
| | Main VCR Device Select | VCRMZ |

ZONE 2 DIRECT SELECT COMMANDS

Note

Use Zone 2 Direct Select Commands only when both zones are on.

| | |
|---|-------|
| Zone 2 Analog Audio Input-1 ³ | AS1RZ |
| Zone 2 Analog Audio Input-2 ³ | AS2RZ |
| Zone 2 Analog Audio Input-3 ³ | AS3RZ |
| Zone 2 Analog Audio Input-4 ³ | AS4RZ |
| Zone 2 Analog Audio Input-5 ³ | AS5RZ |
| Zone 2 Analog Audio Input-6 ³ | AS6RZ |
| Zone 2 Analog Audio Input-7 ³ | AS7RZ |
| Zone 2 Analog Balanced Input ³ AB1RZ | |
| Zone 2 Analog Tape Select ³ | TPARZ |
| Zone 2 Analog VCR Select ³ | VCARZ |
| Zone 2 Aux1 | AU1RZ |
| Zone 2 Aux2 | AU2RZ |
| Zone 2 CD | CDRZ |
| Zone 2 DVD | DVDRZ |
| Zone 2 LD | LDRZ |
| Zone 2 Satellite | SATRZ |
| Zone 2 Tape | TPRZ |
| Zone 2 Tuner | TUNRZ |
| Zone 2 TV | TVRZ |
| Zone 2 VCR | VCRRZ |

³ If only zone 2 is on, use instead the Generic Zone Direct Select Commands, on page 6.

RS-232 Commands for the Home Theater Standard 7.1, continued

| | COMMAND | RS-232 CODE |
|---------------------------------|----------------|--|
| POWER COMMANDS | Power On | 1PWRZ |
| | Power Off | 0PWRZ |
| ZONE SELECT COMMANDS | Main Zone | MANZ |
| | Zone 2 | Zone 2 power toggle if main zone is OFF REMZ |
| ROOM EQ COMMAND | Room EQ Select | XXX = 000-004 (000 = OFF) (001-004 selects memory 1-4) XXXEQMZ |
| TRIGGER COMMANDS | Trigger-1 | OFF 0TR1Z |
| | Trigger-1 | ON 1TR1Z |
| | Trigger-2 | OFF 0TR2Z |
| | Trigger-2 | ON 1TR2Z |
| | Trigger-3 | OFF 0TR3Z |
| | Trigger-3 | ON 1TR3Z |
| | Trigger-4 | OFF 0TR4Z |
| | Trigger-4 | ON 1TR4Z |

RS-232 Commands for the Home Theater Standard 7.1, continued

| DECODE MODE SELECT COMMANDS | COMMAND | RS-232 CODE |
|--------------------------------|-----------------------|-------------|
| | Mode 1 | |
| Mode 2 | | MS2Z |
| Prologic | | MVZ |
| Stereo | | STZ |
| Preamp | | PAZ |
| THX | | THXZ |
| Audio Decode Set Mode | 000 - 038, sets mode* | XXXMODZ |

* Refer to the list of audio decode modes and corresponding codes on page 10 to set the mode. Modes that do not apply to the current input stream are ignored.

RS-232 Commands for the Home Theater Standard 7.1, continued

*Audio decode modes
and corresponding codes*

| AUDIO DECODE MODE | CODE |
|---|------|
| Dolby Digital 5.1 | 000 |
| Dolby Digital 5.1 + THX | 001 |
| Dolby Digital 5.1 + THX EX | 002 |
| AC3 2/0 Stereo Mode (Pass Mode) | 003 |
| AC3 2/0 Pro-Logic II Movie Mode | 004 |
| AC3 2/0 Pro-Logic II Music Mode | 005 |
| AC3 2/0 Pro-Logic II Matrix Mode | 006 |
| AC3 2/0 Pro-Logic II Emulation Mode | 007 |
| AC3 2/0 Pro-Logic II Movie +THX Mode | 008 |
| AC3 2/0 Pro-Logic II Emulation+THX Mode | 009 |
| DTS 5.1 Music | 010 |
| DTS 5.1 Movie | 011 |
| DTS 5.1 Matrix | 012 |
| DTS 5.1 Movie + THX | 013 |
| DTS 5.1 Matrix + THX | 014 |
| DTS 6.1 Discrete | 015 |
| DTS 6.1 Discrete + THX | 016 |
| DTS 5.1 Force | 017 |
| Stereo Mode (Pass Mode) | 018 |
| Pro-Logic II Movie Mode | 019 |
| Pro-Logic II Music Mode | 020 |
| Pro-Logic II Matrix Mode | 021 |
| Pro-Logic II Emulation Mode | 022 |
| Pro-Logic II Movie + THX Mode | 023 |
| Pro-Logic II Emulation + THX | 024 |
| DTS Neo:6 Cinema 6 Mode | 025 |
| DTS Neo:6 Music Mode | 026 |
| DTS Neo:6 Cinema 6 + THX Mode | 027 |
| Party Mode | 028 |
| General Admission Mode | 029 |
| Front Row Mode | 030 |
| On Stage Mode | 031 |
| Enhanced Stereo Mode | 032 |
| Orchestra Mode | 033 |
| Mezzanine Mode | 034 |
| Full Range + Sub Mode | 035 |
| Monophonic Mode | 036 |
| 24/96 Decode Mode | 038 |

RS-232 Status Feedback Description for the Home Theater Standard 7.1

The Home Theater Standard 7.1 reports its operational status by transmitting a block of status data via the RS-232 connector. The block is configured as eighteen 8-bit words. The first and last word always contains hexadecimal code 55 to facilitate message framing and synchronization. When the data block is sent through an RS-232 port, each 8-bit word transmitted will also have 1 stop bit associated with it. The exact RS-232 protocol settings for both status and Home Theater Standard 7.1 control are as follows:

9600 Baud 8 Data Bits 1 Stop Bit No Parity

The feedback system is available only through the RS-232 connector. The status can be activated in two ways. The first is to ask for status to be sent by sending the RS-232 command code "STAZ". The second is to enable auto status by sending the RS-232 command code "ASTEZ". Once the auto status command is sent, the Home Theater Standard 7.1 will transmit a status block whenever the status changes. Auto status is disabled by sending the RS-232 command code "ASTDZ". Auto status remains enabled until AC power is removed or turned off. When AC power is reapplied, auto status is disabled.

RS-232 Status Block Descriptions for the Home Theater Standard 7.1

All numeric values described in the following charts are decimal values unless otherwise noted. The description of the eighteen 8-bit words follow.

The values marked Reserved must be ignored during pattern matching.

Word 1: Start of Message

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|---|---|---|---|---|---|---|---|
| Description | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

Bit 7 – 0: Hexadecimal 55

Word 2: General Status I

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------------|-----------|-------------|--------------|---------------|-------------|--------------|------------|
| Description | System Mute | User Mute | Zone 2 Mute | Current Zone | Input Trigger | Zone 2 Only | Zone 2 Power | Main Power |

| | | | |
|---------------------|-----------------------------|----------------------|---------------------------------|
| Bit 7: System Mute | 1 = Internal mute is active | Bit 3: Input Trigger | 1 = 12V input trigger is active |
| Bit 6: Main Mute | 1 = Main mute is active | Bit 2: Zone 2 Only | 1 = Only Zone 2 power is on |
| Bit 5: Zone 2 Mute | 1 = Zone 2 mute is active | Bit 1: Zone 2 Power | 1 = Zone 2 power is on |
| Bit 4: Current Zone | 1 = Zone 2 is active | Bit 0: Main Power | 1 = Main power is on |

RS-232 Status Block Descriptions, continued

Word 3: General Status II

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-----------|---------------------|------------|--------------|--------------|--------------|--------------|-------------|
| Description | Menu Mode | Auto Status Enabled | PLL Locked | Trigger 4 On | Trigger 3 On | Trigger 2 On | Trigger 1 On | DSP Running |

Bit 7: Menu mode 1 = Menu mode is active
 Bit 6: Auto Status 1 = Auto status enabled
 Bit 5: PLL Locked 1 = PLL is locked (valid digital input signal detected)
 Bit 4: Trigger 4 On 1 = Trigger 4 is on
 Bit 3: Trigger 3 On 1 = Trigger 3 is on
 Bit 2: Trigger 2 On 1 = Trigger 2 is on
 Bit 1: Trigger 1 On 1 = Trigger 1 is on
 Bit 0: DSP Running 1 = DSPs are not reset

Word 4: Current Device

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|--------|--------|--------|--------|--------|--------|--------|--------|
| Description | Z2 CD3 | Z2 CD2 | Z2 CD1 | Z2 CD0 | MN CD3 | MN CD2 | MN CD1 | MN CD0 |

Bits 7 – 4: Zone 2 Current Device
 Bits 3 – 0: Main Zone Current Device

Devices

| | |
|-------|---------|
| 0 DVD | 5 CD |
| 1 LD | 6 TUNER |
| 2 SAT | 7 AUX 1 |
| 3 VCR | 8 AUX 2 |
| 4 TV | 9 TAPE |

Word 5: Volume

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Description | VOL 7 | VOL 6 | VOL 5 | VOL 4 | VOL 3 | VOL 2 | VOL 1 | VOL 0 |

Bit 7 – 0: Current Volume setting 0 – 152

Word 6: Zone 2 Volume

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Description | VOL 7 | VOL 6 | VOL 5 | VOL 4 | VOL 3 | VOL 2 | VOL 1 | VOL 0 |

Bit 7 – 0: Current Zone 2 Volume setting 0 – 152

Word 7: Video Input

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Description | VID IN 7 | VID IN 6 | VID IN 5 | VID IN 4 | VID IN 3 | VID IN 2 | VID IN 1 | VID IN 0 |

Bit 7 – 0: Current Video Input

Video Inputs

| | |
|---------------------|----------------------|
| 1 S-Video 1 | 7 Reserved |
| 2 S-Video 2 | 8 Composite Video 1 |
| 3 S-Video 3 | 9 Composite Video 2 |
| 4 S-Video 4 | 10 Composite Video 3 |
| 5 Component Video 1 | 11 Composite Video 4 |
| 6 Component Video 2 | |

RS-232 Status Block Descriptions, continued

Word 8: Main Zone Audio Input

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Description | MN AUD IN 7 | MN AUD IN 6 | MN AUD IN 5 | MN AUD IN 4 | MN AUD IN 3 | MN AUD IN 2 | MN AUD IN 1 | MN AUD IN 0 |

Bit 7 – 0: Main Zone Audio Input

Audio Inputs

| | |
|----------------------|-----------------|
| 1 Digital: COAX 1 | 10 Analog: S1 |
| 2 Digital: COAX 2 | 11 Analog: S2 |
| 3 Digital: COAX 3 | 12 Analog: S3 |
| 4 Digital: COAX 4 | 13 Analog: S4 |
| 5 Digital: COAX 5 | 14 Analog: S5 |
| 6 Digital: COAX 6 | 15 Analog: S6 |
| 7 Digital: Optical 1 | 16 Analog: S7 |
| 8 Digital: Optical 2 | 17 Analog: Tape |
| 9 Analog: B1 | 18 Analog: VCR |

Word 9: Zone 2 Audio Input

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Description | Z2 AUD IN 7 | Z2 AUD IN 6 | Z2 AUD IN 5 | Z2 AUD IN 4 | Z2 AUD IN 3 | Z2 AUD IN 2 | Z2 AUD IN 1 | Z2 AUD IN 0 |

Bit 7 – 0: Zone 2 Audio Input

Audio Inputs

| | |
|----------------------|-----------------|
| 1 Digital: COAX 1 | 10 Analog: S1 |
| 2 Digital: COAX 2 | 11 Analog: S2 |
| 3 Digital: COAX 3 | 12 Analog: S3 |
| 4 Digital: COAX 4 | 13 Analog: S4 |
| 5 Digital: COAX 5 | 14 Analog: S5 |
| 6 Digital: COAX 6 | 15 Analog: S6 |
| 7 Digital: Optical 1 | 16 Analog: S7 |
| 8 Digital: Optical 2 | 17 Analog: Tape |
| 9 Analog: B1 | 18 Analog: VCR |

Word 10: Loudspeakers / Current Audio Stream

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|--------------|-------------|------------------|----------------|----------------|----------------|----------------|----------------|
| Description | Back Enabled | Sub Enabled | Surround Enabled | Center Enabled | Input Stream 3 | Input Stream 2 | Input Stream 1 | Input Stream 0 |

Bit 7: Back Enabled 1 = Back loudspeaker(s) is(are) enabled

Bit 6: Sub Enabled 1 = Subwoofer is enabled

Bit 5: Surround Enabled 1 = Surround loudspeakers are enabled

Bit 4: Center Enabled 1 = Center loudspeaker is enabled

Bits 3–0: Current Input Stream Mode

Input Stream Modes

| | |
|----------------------|---------------------------------|
| 1 PCM | 7 PCM Analog Input |
| 2 Dolby Digital 2.0 | 8 Dolby Digital X/Y |
| 3 Dolby Digital 5.1 | 9 7.1 (8 Channel discrete) |
| 4 DTS 5.1 | 10 DTS 6.1 ES Matrix |
| 5 24-bit, 96 KHz PCM | 11 DTS 6.1 ES Discrete |
| 6 PCM Digital Input | 12 DTS 6.1 ES Matrix & Discrete |

RS-232 Status Block Descriptions, continued

Word 11: Current Audio Decode Modes

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Description | CAD 7 | CAD 6 | CAD 5 | CAD 4 | CAD 3 | CAD 2 | CAD 1 | CAD 0 |

Bit 7 – 0: Current Audio Decode Modes

Analog and PCM Decode Modes

- 1 Stereo Mode (Pass Mode)
- 2 Pro-Logic II Movie Mode
- 3 Pro-Logic II Music Mode
- 4 Pro-Logic II Matrix Mode
- 5 Pro-Logic II Emulation Mode
- 6 Pro-Logic II Movie + THX Mode
- 7 Multichannel Input Mode
- 8 Pro-Logic II Emulation + THX Mode
- 9 DTS Neo:6 Cinema 6 Mode
- 11 DTS Neo:6 Music Mode
- 12 DTS Neo:6 Cinema 6 + THX Mode
- 13 Noise Mode
- 14 Classical Mode
- 15 General Admission Mode
- 16 Front Row Mode
- 17 On Stage Mode
- 18 Enhanced Stereo Mode
- 19 Orchestra Mode
- 20 Mezzanine Mode
- 21 Full Range + Sub Mode
- 22 Monophonic Mode
- 23 Analog-only Preamp Mode

Dolby AC3, 2/0 Modes

- 24 Stereo Mode (Pass Mode)
- 25 Pro-Logic II Movie Mode
- 26 Pro-Logic II Music Mode
- 27 Pro-Logic II Matrix Mode
- 28 Pro-Logic II Emulation Mode
- 29 Pro-Logic II Movie + THX Mode
- 30 Pro-Logic II Matrix + THX Mode
- 31 Pro-Logic II Emulation + THX Mode
- 32 was DTS Neo:6 Cinema 6 Mode
- 33 was DTS Neo:6 Cinema 5 Mode
- 34 was DTS Neo:6 Music Mode
- 35 was DTS Neo:6 Cinema 6 + THX Mode
- 36 was DTS Neo:6 Cinema 5 + THX Mode
- 37 Party Mode
- 38 General Admission Mode
- 39 Front Row Mode
- 40 On Stage Mode
- 41 Enhanced Stereo Mode
- 42 Orchestra Mode
- 43 Mezzanine Mode
- 44 Full Range + Sub Mode
- 45 Monophonic Mode
- 46 Analog-only Preamp Mode

Dolby AC3, 5/1 Modes

- 47 Dolby Digital 5.1
- 48 Dolby Digital 5.1 + THX
- 49 Dolby Digital 5.1 + THX EX

Dolby AC3, X/Y Modes

- 65 Dolby Digital 1+1
- 66 Dolby Digital 1/0
- 67 Dolby Digital 3/0
- 68 Dolby Digital 2/1
- 69 Dolby Digital 3/1
- 70 Dolby Digital 2/2

DTS Modes

- 50 DTS 5.1 Movie
- 51 DTS 5.1 Matrix
- 52 DTS 5.1 Movie + THX
- 53 DTS 5.1 Music
- 54 DTS 5.1 Matrix + THX
- 55 DTS 6.1 Discrete
- 56 DTS 6.1 Discrete + THX
- 57 DTS 5.1 Force

24-bit, 96 KHz Modes

- 10 PCM 24-bit, 96 KHz

7.1 (8 Channel Discrete Input) Modes

- 7 7.1

RS-232 Status Block Descriptions, continued

Word 12: Main Zone Balance/Compression Mode

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|----------|---------|---------|-------|-------|-------|-------|-------|
| Description | Reserved | CMode 1 | CMode 0 | BAL 4 | BAL 3 | BAL 2 | BAL 1 | BAL 0 |

Bits 4 - 0: Balance Setting 0 – 26

Bits 5 – 6: Compression Mode

Balance Settings

| | | | | | | | | |
|---|-------|------|----|----------|------|----|-------|------|
| 0 | Right | Off | 9 | Left | +2.0 | 18 | Right | +2.5 |
| 1 | Left | +6 | 10 | Left | +1.5 | 19 | Right | +3.0 |
| 2 | Left | +5.5 | 11 | Left | +1.0 | 20 | Right | +3.5 |
| 3 | Left | +5.0 | 12 | Left | +0.5 | 21 | Right | +4.0 |
| 4 | Left | +4.5 | 13 | Centered | 0 | 22 | Right | +4.5 |
| 5 | Left | +4.0 | 14 | Right | +0.5 | 23 | Right | +5.0 |
| 6 | Left | +3.5 | 15 | Right | +1.0 | 24 | Right | +5.5 |
| 7 | Left | +3.0 | 16 | Right | +1.5 | 25 | Right | +6.0 |
| 8 | Left | +2.5 | 17 | Right | +2.0 | 26 | Left | Off |

Compression Modes

| | | | | | |
|---|-----|---|--------|---|-------|
| 1 | Max | 2 | Normal | 3 | Night |
|---|-----|---|--------|---|-------|

Word 13: Room EQ/Zone 2 Balance

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|-----------|-----------|-----------|-------|-------|-------|-------|-------|
| Description | Room EQ 2 | Room EQ 1 | Room EQ 0 | BAL 4 | BAL 3 | BAL 2 | BAL 1 | BAL 0 |

Bits 7 – 5: Room EQ Setting

Room EQ Setting

| | |
|---|------------------|
| 0 | Room EQ OFF |
| 1 | Room EQ Memory 1 |
| 2 | Room EQ Memory 2 |
| 3 | Room EQ Memory 3 |
| 4 | Room EQ Memory 4 |

Bits 4 - 0: Balance Setting 0 – 26

Balance Settings

| | | | | | | | | |
|---|-------|------|----|----------|------|----|-------|------|
| 0 | Right | Off | 9 | Left | +2.0 | 18 | Right | +2.5 |
| 1 | Left | +6 | 10 | Left | +1.5 | 19 | Right | +3.0 |
| 2 | Left | +5.5 | 11 | Left | +1.0 | 20 | Right | +3.5 |
| 3 | Left | +5.0 | 12 | Left | +0.5 | 21 | Right | +4.0 |
| 4 | Left | +4.5 | 13 | Centered | 0 | 22 | Right | +4.5 |
| 5 | Left | +4.0 | 14 | Right | +0.5 | 23 | Right | +5.0 |
| 6 | Left | +3.5 | 15 | Right | +1.0 | 24 | Right | +5.5 |
| 7 | Left | +3.0 | 16 | Right | +1.5 | 25 | Right | +6.0 |
| 8 | Left | +2.5 | 17 | Right | +2.0 | 26 | Left | Off |

RS-232 Status Block Descriptions, continued

Word 14: Center Trim

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|----------|----------|----------|------|------|------|------|------|
| Description | Reserved | Reserved | Reserved | CT 4 | CT 3 | CT 2 | CT 1 | CT 0 |

Bits 4 – 0: Center Trim

Trim Settings

| | | | |
|---|--------|----|--------|
| 0 | -10 dB | 10 | 0 dB |
| 1 | -9 dB | 11 | +1 dB |
| 2 | -8 dB | 12 | +2 dB |
| 3 | -7 dB | 13 | +3 dB |
| 4 | -6 dB | 14 | +4 dB |
| 5 | -5 dB | 15 | +5 dB |
| 6 | -4 dB | 16 | +6 dB |
| 7 | -3 dB | 17 | +7 dB |
| 8 | -2 dB | 18 | +8 dB |
| 9 | -1 dB | 19 | +9 dB |
| | | 20 | +10 dB |

Word 15: Surround Trim

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|---------------------|----------|----------|------|------|------|------|------|
| Description | Mode 1/2 LED Status | Reserved | Reserved | RT 4 | RT 3 | RT 2 | RT 1 | RT 0 |

Bit 7: Mode 1/2 LED Status 1 = Mode 1 LED is On, 0 = Mode 2 LED is On

Bits 4 – 0: Surround Trim

Trim Settings

| | | | | | |
|---|--------|----|-------|----|--------|
| 0 | -10 dB | 7 | -3 dB | 14 | +4 dB |
| 1 | -9 dB | 8 | -2 dB | 15 | +5 dB |
| 2 | -8 dB | 9 | -1 dB | 16 | +6 dB |
| 3 | -7 dB | 10 | 0 dB | 17 | +7 dB |
| 4 | -6 dB | 11 | +1 dB | 18 | +8 dB |
| 5 | -5 dB | 12 | +2 dB | 19 | +9 dB |
| 6 | -4 dB | 13 | +3 dB | 20 | +10 dB |

Word 16: Back Trim

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|----------|----------|----------|------|------|------|------|------|
| Description | Reserved | Reserved | Reserved | BT 4 | BT 3 | BT 2 | BT 1 | BT 0 |

Bits 4 – 0: Back Trim

Trim Settings

| | | | | | |
|---|--------|----|-------|----|--------|
| 0 | -10 dB | 7 | -3 dB | 14 | +4 dB |
| 1 | -9 dB | 8 | -2 dB | 15 | +5 dB |
| 2 | -8 dB | 9 | -1 dB | 16 | +6 dB |
| 3 | -7 dB | 10 | 0 dB | 17 | +7 dB |
| 4 | -6 dB | 11 | +1 dB | 18 | +8 dB |
| 5 | -5 dB | 12 | +2 dB | 19 | +9 dB |
| 6 | -4 dB | 13 | +3 dB | 20 | +10 dB |

RS-232 Status Block Descriptions, continued

Word 17: Sub Trim

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|----------|----------|----------|------|------|------|------|------|
| Description | Reserved | Reserved | Reserved | ST 4 | ST 3 | ST 2 | ST 1 | ST 0 |

Bits 4 – 0: Sub Trim

Trim Settings

| | | | | | |
|---|--------|----|-------|----|--------|
| 0 | -10 dB | 7 | -3 dB | 14 | +4 dB |
| 1 | -9 dB | 8 | -2 dB | 15 | +5 dB |
| 2 | -8 dB | 9 | -1 dB | 16 | +6 dB |
| 3 | -7 dB | 10 | 0 dB | 17 | +7 dB |
| 4 | -6 dB | 11 | +1 dB | 18 | +8 dB |
| 5 | -5 dB | 12 | +2 dB | 19 | +9 dB |
| 6 | -4 dB | 13 | +3 dB | 20 | +10 dB |

Word 18: End of Message

| Bit | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|-------------|---|---|---|---|---|---|---|---|
| Description | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 |

Bit 7 – 0: Hexadecimal 55

RC-5 Commands for the Home Theater Standard 7.1

The following codes are used for controlling the Home Theater Standard 7.1 via IR.

| SYSTEM (HEX) | COMMAND (HEX) | SYSTEM (DEC) | COMMAND (DEC) | RC5 WORD (HEX) | HOME THEATER STANDARD 7.1 |
|--------------|---------------|--------------|---------------|----------------|---------------------------|
| 1C | 1 | 28 | 1 | 3701 | SUB |
| 1C | 2 | 28 | 2 | 3702 | REAR |
| 1C | 6 | 28 | 6 | 3706 | CENTER |
| 1C | 7 | 28 | 7 | 3707 | MUTE |
| 1C | B | 28 | 11 | 370B | DOWN |
| 1C | C | 28 | 12 | 370C | MENU |
| 1C | D | 28 | 13 | 370D | RIGHT |
| 1C | E | 28 | 14 | 370E | ENTER |
| 1C | F | 28 | 15 | 370F | LEFT |
| 1C | 10 | 28 | 16 | 3710 | TAPE |
| 1C | 11 | 28 | 17 | 3711 | UP |
| 1C | 12 | 28 | 18 | 3712 | PREV |
| 1C | 19 | 28 | 25 | 3719 | 7.1 INPUT |
| 1C | 1A | 28 | 26 | 371A | BALANCE |
| 1C | 1B | 28 | 27 | 371B | B1 |
| 1C | 1C | 28 | 28 | 371C | S1 |
| 1C | 1D | 28 | 29 | 371D | S2 |
| 1C | 1E | 28 | 30 | 371E | S3 |
| 1C | 1F | 28 | 31 | 371F | S4 |
| 1C | 20 | 28 | 32 | 3720 | S5 |
| 1C | 21 | 28 | 33 | 3721 | COAX1 |
| 1C | 22 | 28 | 34 | 3722 | COAX2 |
| 1C | 23 | 28 | 35 | 3723 | OPT1 |
| 1C | 24 | 28 | 36 | 3724 | OPT2 |
| 1C | 27 | 28 | 39 | 3727 | TAPE ON |
| 1C | 28 | 28 | 40 | 3728 | TAPE OFF |
| 1C | 29 | 28 | 41 | 3729 | S-VIDEO1 |
| 1C | 2A | 28 | 42 | 372A | S-VIDEO2 |
| 1C | 2B | 28 | 43 | 372B | S-VIDEO3 |
| 1C | 2C | 28 | 44 | 372C | S-VIDEO4 |
| 1C | 2D | 28 | 45 | 372D | COMPOSITE1 |
| 1C | 2E | 28 | 46 | 372E | COMPOSITE2 |
| 1C | 2F | 28 | 47 | 372F | COMPOSITE3 |
| 1C | 30 | 28 | 48 | 3730 | COMPOSITE4 |
| 1C | 33 | 28 | 51 | 3733 | MUSIC1 |
| 1C | 35 | 28 | 53 | 3735 | STEREO |
| 1C | 37 | 28 | 55 | 3737 | VOL ZERO |
| 1C | 38 | 28 | 56 | 3738 | PWR ON |
| 1C | 39 | 28 | 57 | 3739 | PWR OFF |
| 1C | 3A | 28 | 58 | 373A | MUTE ON |
| 1C | 3B | 28 | 59 | 373B | MUTE OFF |
| 1C | 3C | 28 | 60 | 373C | VOL +10 |
| 1C | 3D | 28 | 61 | 373D | VOL -10 |
| 1C | 3E | 28 | 62 | 373E | PROLOGIC |
| 19 | 0 | 25 | 0 | 3640 | MUSIC2 |
| 19 | 1 | 25 | 1 | 3641 | DVD |
| 19 | 2 | 25 | 2 | 3642 | LD |
| 19 | 3 | 25 | 3 | 3643 | SAT |
| 19 | 4 | 25 | 4 | 3644 | VCR |

RC-5 Commands for the Home Theater Standard 7.1, continued

| SYSTEM (HEX) | COMMAND (HEX) | SYSTEM (DEC) | COMMAND (DEC) | RC5 WORD (HEX) | HOME THEATER STANDARD 7.1 |
|-----------------|------------------|-----------------|------------------|-------------------|------------------------------|
| 19 | 5 | 25 | 5 | 3645 | TV |
| 19 | 6 | 25 | 6 | 3646 | CD |
| 19 | 7 | 25 | 7 | 3647 | TUNER |
| 19 | 8 | 25 | 8 | 3648 | AUX1 |
| 19 | 9 | 25 | 9 | 3649 | AUX2 |
| 19 | A | 25 | 10 | 364A | MAIN ZONE |
| 19 | B | 25 | 11 | 364B | ZONE 2 |
| 19 | C | 25 | 12 | 364C | USER |
| 19 | D | 25 | 13 | 364D | VCR INPUT |
| 19 | E | 25 | 14 | 364E | TAPE INPUT |
| 19 | 10 | 25 | 16 | 3650 | COMPONENT1 |
| 19 | 11 | 25 | 17 | 3651 | COMPONENT2 |
| 19 | 12 | 25 | 18 | 3652 | COAX3 |
| 19 | 13 | 25 | 19 | 3653 | COAX4 |
| 19 | 13 | 25 | 19 | 3654 | COAX5 |
| 19 | 15 | 25 | 21 | 3655 | COAX6 |
| 19 | 16 | 25 | 22 | 3656 | TRIGGER1 ON |
| 19 | 17 | 25 | 23 | 3657 | TRIGGER1 OFF |
| 19 | 18 | 25 | 24 | 3658 | TRIGGER2 ON |
| 19 | 19 | 25 | 25 | 3659 | TRIGGER2 OFF |
| 19 | 1A | 25 | 26 | 365A | TRIGGER3 ON |
| 19 | 1B | 25 | 27 | 365B | TRIGGER3 OFF |
| 19 | 1C | 25 | 28 | 365C | TRIGGER4 ON |
| 19 | 1D | 25 | 29 | 365D | TRIGGER4 OFF |
| 19 | 1E | 25 | 30 | 365E | Z2 PWR ON |
| 19 | 1F | 25 | 31 | 365F | Z2 PWR OFF |
| 19 | 20 | 25 | 32 | 3668 | MAX DYNR |
| 19 | 21 | 25 | 33 | 3669 | NIGHT DYNR |
| 19 | 22 | 25 | 34 | 366A | NORM DYNR |
| 1C | 14 | 28 | 20 | 3714 | EQ OFF |
| 1C | 15 | 28 | 21 | 3715 | EQ MEM1 |
| 1C | 16 | 28 | 22 | 3716 | EQ MEM2 |
| 1C | 17 | 28 | 23 | 3717 | EQ MEM3 |
| 1C | 18 | 28 | 24 | 3718 | EQ MEM4 |
| 19 | 30 | 25 | 48 | 3670 | DIGIT 0 |
| 19 | 31 | 25 | 49 | 3671 | DIGIT 1 |
| 19 | 32 | 25 | 50 | 3672 | DIGIT 2 |
| 19 | 33 | 25 | 51 | 3673 | DIGIT 3 |
| 19 | 34 | 25 | 52 | 3674 | DIGIT 4 |
| 19 | 35 | 25 | 53 | 3675 | DIGIT 5 |
| 19 | 36 | 25 | 54 | 3676 | DIGIT 6 |
| 19 | 37 | 25 | 55 | 3677 | DIGIT 7 |
| 19 | 38 | 25 | 56 | 3678 | DIGIT 8 |
| 19 | 39 | 25 | 57 | 3679 | DIGIT 9 |
| 19 | 3A | 25 | 58 | 367A | SET MODE** |

***The SET MODE command allows the user to set a specific audio decode mode using RC 5 commands. The code is set by sending the unit the SET MODE command, then the two DIGIT commands which define the mode. These three commands must occur in sequence; any command sent after the SET MODE command, other than the DIGIT commands, causes the SET MODE sequence to be reset. Refer to the list of audio decode modes on page 20. Modes that do not apply to the current input stream are ignored.*

RC-5 Commands for the Home Theater Standard 7.1, continued

*Audio decode modes
and corresponding codes*

| AUDIO DECODE MODE | CODE |
|---|------|
| Dolby Digital 5.1 | 00 |
| Dolby Digital 5.1 + THX | 01 |
| Dolby Digital 5.1 + THX EX | 02 |
| AC3 2/0 Stereo Mode (Pass Mode) | 03 |
| AC3 2/0 Pro-Logic II Movie Mode | 04 |
| AC3 2/0 Pro-Logic II Music Mode | 05 |
| AC3 2/0 Pro-Logic II Matrix Mode | 06 |
| AC3 2/0 Pro-Logic II Emulation Mode | 07 |
| AC3 2/0 Pro-Logic II Movie +THX Mode | 08 |
| AC3 2/0 Pro-Logic II Emulation+THX Mode | 09 |
| DTS 5.1 Music | 10 |
| DTS 5.1 Movie | 11 |
| DTS 5.1 Matrix | 12 |
| DTS 5.1 Movie + THX | 13 |
| DTS 5.1 Matrix + THX | 14 |
| DTS 6.1 Discrete | 15 |
| DTS 6.1 Discrete + THX | 16 |
| DTS 5.1 Force | 17 |
| Stereo Mode (Pass Mode) | 18 |
| Pro-Logic II Movie Mode | 19 |
| Pro-Logic II Music Mode | 20 |
| Pro-Logic II Matrix Mode | 21 |
| Pro-Logic II Emulation Mode | 22 |
| Pro-Logic II Movie + THX Mode | 23 |
| Pro-Logic II Emulation + THX | 24 |
| DTS Neo:6 Cinema 6 Mode | 25 |
| DTS Neo:6 Music Mode | 26 |
| DTS Neo:6 Cinema 6 + THX Mode | 27 |
| Party Mode | 28 |
| General Admission Mode | 29 |
| Front Row Mode | 30 |
| On Stage Mode | 31 |
| Enhanced Stereo Mode | 32 |
| Orchestra Mode | 33 |
| Mezzanine Mode | 34 |
| Full Range + Sub Mode | 35 |
| Monophonic Mode | 36 |
| 24/96 Decode Mode | 38 |