



PARASOUND

# Halo C1 and C2 Surround Controllers

## RS232 Guide

### ↳ Technical Specifications:

- Baud rate 9600bps
- 8 data bits, one stop bit, no parity
- Binary transmission, no flow control
- TXD on pin 2, RXD on pin 3, GND on pin 5
- Requires DB9 (serial) straight through cable (NOT null modem)

### ↳ Basic System Control:

The following is the basic RS232 codes for controlling your Parasound Surround controller. Both Decimal and corresponding Hexadecimal codes are listed, as well as an example of a Decimal string and Crestron string in HEX. There is no need to place spaces (line feed) between numbers (Bytes). Carriage returns are not required at any point in transmission. If you wish to use HEX but are not using a Crestron system simply remove the “\x” shown in examples.

**Before each command you must issue the “RS Enable” command of “224 82 83 33”. In Hex this would be “E0 52 53 21”.**

Command Action	Decimal Code	Hex Code	Decimal String Example	Crestron String Example in Hex
Enable RS 232 Reception	224 82 83 33	E0 52 53 21	THIS MUST PRECEDE EVERY COMMAND	

#### POWER CONTROL

Power off (Standby)	34	22	224 82 83 33 34	\xE0\x52\x53\x21\x22
Power on	35	23	224 82 83 33 35	\xE0\x52\x53\x21\x23
Power Toggle	6	06	224 82 83 33 6	\xE0\x52\x53\x21\x06

#### VOLUME CONTROL

Volume Plus	53	35	224 82 83 33 53	\xE0\x52\x53\x21\x35
Volume Minus	54	36	224 82 83 33 54	\xE0\x52\x53\x21\x36
Mute Toggle	7	07	224 82 83 33 7	\xE0\x52\x53\x21\x07
Mute On	32	20	224 82 83 33 32	\xE0\x52\x53\x21\x20
Mute Off	33	21	224 82 83 33 33	\xE0\x52\x53\x21\x21



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## ▷ Basic System Control (continued):

Command Action	Decimal Code	Hex Code	Decimal String Example	Crestron String Example in Hex
<b>SOURCE SELECTION</b>				
Source Plus	8	08	224 82 83 33 8	\xE0\x52\x53\x21\x08
Source Minus	9	09	224 82 83 33 9	\xE0\x52\x53\x21\x09
Source Video 1	13	0D	224 82 83 33 13	\xE0\x52\x53\x21\x0D
Source Video 2	14	0E	224 82 83 33 14	\xE0\x52\x53\x21\x0E
Source Video 3	15	0F	224 82 83 33 15	\xE0\x52\x53\x21\x0F
Source Video 4	16	10	224 82 83 33 16	\xE0\x52\x53\x21\x10
Source Video 5	17	11	224 82 83 33 17	\xE0\x52\x53\x21\x11
Source Video 6	18	12	224 82 83 33 18	\xE0\x52\x53\x21\x12
Source Audio 1	19	13	224 82 83 33 19	\xE0\x52\x53\x21\x13
Source Audio 2	20	14	224 82 83 33 20	\xE0\x52\x53\x21\x14
Source Audio 3	72	48	224 82 83 33 72	\xE0\x52\x53\x21\x48
Source Audio 4	73	49	224 82 83 33 73	\xE0\x52\x53\x21\x49
Source Analog 7.1	100	64	224 82 83 33 100	\xE0\x52\x53\x21\x64
Source Analog 7.1 Toggle	136	88	224 82 83 33 136	\xE0\x52\x53\x21\x88
Active Source Auto Search	144	90	224 82 83 33 144	\xE0\x52\x53\x21\x90

<b>SURROUND MODE SELECTION</b>				
Surround Mode Minus	10	0A	224 82 83 33 10	\xE0\x52\x53\x21\x0A
Surround Mode Plus	11	0B	224 82 83 33 11	\xE0\x52\x53\x21\x0B
Mono	42	2A	224 82 83 33 42	\xE0\x52\x53\x21\x2A
Stereo*(see note below)	43	2B	224 82 83 33 43	\xE0\x52\x53\x21\x2B
Prologic	44	2C	224 82 83 33 44	\xE0\x52\x53\x21\x2C
Natural	45	2D	224 82 83 33 45	\xE0\x52\x53\x21\x2D
Party	46	2E	224 82 83 33 46	\xE0\x52\x53\x21\x2E
Club	47	2F	224 82 83 33 47	\xE0\x52\x53\x21\x2F
Concert	48	30	224 82 83 33 48	\xE0\x52\x53\x21\x30
Prologic II or IIx Movie	160	A0	224 82 83 33 160	\xE0\x52\x53\x21xA0
Prologic II or IIx Music	161	A1	224 82 83 33 161	\xE0\x52\x53\x21xA1
DTS Neo6 Cinema	162	A2	224 82 83 33 162	\xE0\x52\x53\x21xA2
DTSES Matrix	163	A3	224 82 83 33 163	\xE0\x52\x53\x21xA3
Direct	164	A4	224 82 83 33 164	\xE0\x52\x53\x21xA4
DTS NEO6 Music	167	A7	224 82 83 33 167	\xE0\x52\x53\x21xA7
Dolby EX	168	A8	224 82 83 33 168	\xE0\x52\x53\x21xA8
Stereo 96	169	A9	224 82 83 33 169	\xE0\x52\x53\x21xA9
Late Night ON (DYN)	37	25	224 82 83 33 37	\xE0\x52\x53\x21\x25
Late Night Off (DYN)	38	26	224 82 83 33 38	\xE0\x52\x53\x21\x26
Late Night Toggle (DYN)	12	0C	224 82 83 33 12	\xE0\x52\x53\x21\x0C
Cinema EQ Toggle	99	63	224 82 83 33 99	\xE0\x52\x53\x21\x63
THX Toggle	27	1B	224 82 83 33 27	\xE0\x52\x53\x21\x1B

\* Please note that for a more universal stereo command, we recommend using a 2 step macro. First issue the command for direct (164), then the command for stereo (43). This Macro ensures that the surround mode will always go to stereo regardless of input type. A Crestron string in Hex would look like this “\xE0\x52\x53\x21xA4\xE0\x52\x53\x21\x2B”



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## ▷ Basic System Control (continued):

Command Action	Decimal Code	Hex Code	Decimal String Example	Crestron String Example in Hex
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### TONE AND SPEAKER TRIM CONTROL

Bass Plus	68	44	224 82 83 33 68	\xE0\x52\x53\x21\x44
Bass Minus	69	45	224 82 83 33 69	\xE0\x52\x53\x21\x45
Treble Plus	70	46	224 82 83 33 70	\xE0\x52\x53\x21\x46
Treble Minus	71	47	224 82 83 33 71	\xE0\x52\x53\x21\x47
Subwoofer Plus	97	61	224 82 83 33 97	\xE0\x52\x53\x21\x61
Subwoofer Minus	98	62	224 82 83 33 98	\xE0\x52\x53\x21\x62
Surround Plus	131	83	224 82 83 33 131	\xE0\x52\x53\x21\x83
Surround Minus	132	84	224 82 83 33 132	\xE0\x52\x53\x21\x84
Center Plus	129	81	224 82 83 33 129	\xE0\x52\x53\x21\x81
Center Minus	130	82	224 82 83 33 130	\xE0\x52\x53\x21\x82
Preset 1	124	7C	224 82 83 33 124	\xE0\x52\x53\x21\x7C
Preset 2	125	7D	224 82 83 33 125	\xE0\x52\x53\x21\x7D
Preset 3	126	7E	224 82 83 33 126	\xE0\x52\x53\x21\x7E
Preset 4	127	7F	224 82 83 33 127	\xE0\x52\x53\x21\x7F
Preset 5	128	80	224 82 83 33 128	\xE0\x52\x53\x21\x80
Enhanced Bass On	156	9C	224 82 83 33 156	\xE0\x52\x53\x21\x9C
Enhanced Bass Off	157	9D	224 82 83 33 157	\xE0\x52\x53\x21\x9D
Enhanced Bass Toggle	133	85	224 82 83 33 133	\xE0\x52\x53\x21\x85

### ZONE CONTROL

Zone Off	4	04	224 82 83 33 4	\xE0\x52\x53\x21\x04
Zone On	5	05	224 82 83 33 5	\xE0\x52\x53\x21\x05
Zone On/Off Toggle	134	86	224 82 83 33 134	\xE0\x52\x53\x21\x86
Zone Volume Plus	139	8B	224 82 83 33 139	\xE0\x52\x53\x21\x8B
Zone Volume Minus	140	8C	224 82 83 33 140	\xE0\x52\x53\x21\x8C
Zone Mute On	158	9E	224 82 83 33 158	\xE0\x52\x53\x21\x9E
Zone Mute Off	159	9F	224 82 83 33 159	\xE0\x52\x53\x21\x9F
Zone Mute Toggle	165	A5	224 82 83 33 165	\xE0\x52\x53\x21xA5
Show Zone Status	166	A6	224 82 83 33 166	\xE0\x52\x53\x21xA6
Zone Source minus	135	87	224 82 83 33 135	\xE0\x52\x53\x21\x87
Zone Source Plus	141	8D	224 82 83 33 141	\xE0\x52\x53\x21\x8D
Zone Source Video 1	74	4A	224 82 83 33 74	\xE0\x52\x53\x21\x4A
Zone Source Video 2	75	4B	224 82 83 33 75	\xE0\x52\x53\x21\x4B
Zone Source Video 3	76	4C	224 82 83 33 76	\xE0\x52\x53\x21\x4C
Zone Source Video 4	77	4D	224 82 83 33 77	\xE0\x52\x53\x21\x4D
Zone Source Video 5	78	4E	224 82 83 33 78	\xE0\x52\x53\x21\x4E
Zone Source Video 6	79	4F	224 82 83 33 79	\xE0\x52\x53\x21\x4F
Zone Source Audio 1	110	6E	224 82 83 33 110	\xE0\x52\x53\x21\x6E
Zone Source Audio 2	111	6F	224 82 83 33 111	\xE0\x52\x53\x21\x6F
Zone Source Audio 3	112	70	224 82 83 33 112	\xE0\x52\x53\x21\x70
Zone Source Audio 4	113	71	224 82 83 33 113	\xE0\x52\x53\x21\x71



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## ▷ Basic System Control (continued):

Command Action	Decimal Code	Hex Code	Decimal String Example	Crestron String Example in Hex
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### TAPE RECORD CONTROL

Tape Monitor Sticky Toggle	26	1A	224 82 83 33 26	\xE0\x52\x53\x21\x1A
Tape Mon. Non-Sticky Toggle	31	1F	224 82 83 33 31	\xE0\x52\x53\x21\x1F
Tape Monitor Off	39	27	224 82 83 33 39	\xE0\x52\x53\x21\x27
Tape Monitor Sticky On	40	28	224 82 83 33 40	\xE0\x52\x53\x21\x28
Tape Monitor Non-Sticky On	41	29	224 82 83 33 41	\xE0\x52\x53\x21\x29

### SETUP MENU CONTROL

Setup Menu Toggle	103	67	224 82 83 33 103	\xE0\x52\x53\x21\x67
Cursor Movement Up	104	68	224 82 83 33 104	\xE0\x52\x53\x21\x68
Cursor Movement Down	105	69	224 82 83 33 105	\xE0\x52\x53\x21\x69
Cursor Movement Left	106	6A	224 82 83 33 106	\xE0\x52\x53\x21\x6A
Cursor Movement Right	107	6B	224 82 83 33 107	\xE0\x52\x53\x21\x6B
Select	108	6C	224 82 83 33 108	\xE0\x52\x53\x21\x6C
Exit Without Save (ESC)	109	6D	224 82 83 33 109	\xE0\x52\x53\x21\x6D
Cursor Step Down	114	72	224 82 83 33 114	\xE0\x52\x53\x21\x72
Test Noise (CAL)	23	17	224 82 83 33 23	\xE0\x52\x53\x21\x17

### OTHER FEATURES

Lock/Unlock Front Panel Toggle	145	91	224 82 83 33 145	\xE0\x52\x53\x21\x91
Show Status On Screen	122	7A	224 82 83 33 122	\xE0\x52\x53\x21\x7A
Ping and Hello Response	80	50	224 82 83 33 80	\xE0\x52\x53\x21\x50



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## ▷ Multi Command Strings for Advanced Discrete Control

The following commands require at least two data bytes. Format is:  
<RS Enable String><Command #1><Command #2>...<Command #X>

For example, the command “224 82 83 33 167 180 81” would set the Main Volume to –19db.  
The same command in Hex for Crestron would be this: \xE0\x52\x53\x21\xB4\x51

*Don't Forget to issue the RS Enable command before each command*

Command Action	Command #	Decimal Code	Hex Code	Description (Decimal)
<b>Set Main Volume</b>	1	180	B4	
	2	10...106	0A...6A	10 = Volume of –90db 81 = Volume of –19db 100 = Volume of 0db
<b>Set Zone Volume</b>	1	182	B6	
	2	10...100	0A...64	10 = Volume of –90db 81 = Volume of –19db 100 = Volume of 0db
<b>Set PLII Parameters</b>	1	184	B8	
	2	0 or 1	00 or 01	Panorama: 0 = Off, 1 = On
	3	0...7	00...07	Center Width: 0 = Narrow, 7 = Wide
	4	0...6	00...06	Dimension: 0 = Front biased, 6 = Max surround
<b>Set Neo6 Paramaters</b>	1	185	B9	
	2	0...5	00...05	Center Image: 0 = Narrow, 5 = Wide



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## ▷ System Status and Feedback

The following data is sent out the RS port whenever the status of the current parameter or function is changed. The output data consists of at least three bytes in this format:

**<command code> <data> <255>**

For example, when the main zone volume is changed to -19db, the following three bytes are sent out:

**225 81 255**

225 is the parameter code for volume, 81 is the data indicating volume level, 255 indicates the end of transmission of that particular data block. These are not commands; this is the definition of feedback sent from C1 or C2 after any change is made with operation.

Parameter	Data #	Decimal Code	Hex code	Description (Decimal)
Input Type	1	215	D7	
	2	xxxxxxx		
				bits 0 – 2 (LSB): 000 = 1 + 1 (dual mono)
				001 = 1/0
				010 = 2/0
				011 = 3/0
				100 = 2/1
				101 = 3/1
				110 = 2/2
				111 = 3/2
				bit 3 "0 = No LFE, 1 = LFE"
				bits 4 – 5 00 = Not indicated
				01 = Not Dolby Surround decoded
			10 = Dolby surround decoded	
			11 = Reserved	
			Bit 6 0 = Non ES / EX signal	
			1 = ES / EX flag present	
			Bit 7 Reserved	

PLII Parameters	Data #	Decimal Code	Hex code	Description
	1	216	D8	
	2	0 or 1	00 or 01	Panorama: 0 = Off, 1 = On
	3	0...7	00...07	Width: 0 = Narrow, 7 = Wide
	4	0...6	00...06	Dimension: 0 = 3, 6 = -3

Status of Headphones	Data #	Decimal Code	Hex code	Description
	1	224	E0	
	2	0 or 1	00 or 01	Headphones connected (1) or not (0)

Main Volume	Data #	Decimal Code	Hex code	Description
	1	225	E1	
	2	10...106	0A...6A	10 = Volume of -90db
				81 = Volume of -19db
				100 = Volume of 0db



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## ▷ System Status and Feedback (continued):

Parameter	Data #	Decimal Code	Hex code	Description (Decimal)
<b>Mute</b>	1	226	E2	
	2	0 or 1	00 or 01	Main zone mute: 0 = unmuted, 1 = muted
<b>Current Source</b>	1	227	E3	
	2	1...64	01...40	1 = Video 1, 2 = Video 2 ... 10 = Audio 4, 64 = 7.1 Input
<b>Power Status</b>	1	229	E5	
	2	0 or 1	00 or 01	0 = standby, 1 = on
<b>Zone Source</b>	1	230	E6	
	2	1...6	01...06	1 = Video 1, 2 = Video 2 ... 10 = Audio 4
<b>Zone Volume</b>	1	232	E8	
	2	10...100	0A...64	10 = Volume of -90db 81 = Volume of -19db 100 = Volume of 0db
<b>Zone Mute</b>	1	233	E9	
	2	0 or 1	00 or 01	0 = unmuted, 1 = muted
<b>Dimmer</b>	1	234	EA	
	2	0 or 1	00 or 01	0 = bright, 1 = dimmed
<b>Surround Mode</b>	1	236	EC	
	2	0...17	00...11	0 = Direct (Stereo with 2 channel audio material) 1 = Dolby Pro Logic 2 = Natural 3 = Club 4 = Concert 6 = Party 7 = Mono downmix 9 = Surround 6.1 12 = Stereo downmix 13 = Pro Logic II Movie 14 = Pro Logic II Music 15 = Dolby Digital EX 16 = Neo:6 Cinema 17 = Matrix / Neo:6 20 = Neo:6 Music 21 = Stereo 96 23 = Pro Logic IIx Music 24 = Pro Logic IIx Movie



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## ▷ System Status and Feedback (continued):

Parameter	Data #	Decimal Code	Hex code	Description (Decimal)
Current Audio Type	1	237	ED	
	2	0...10	00...0A	2 = Digital PCM
				3 = Dolby Digital
				4 = DTS
				6 = Noise (generated by the DSP)
				7 = Analog
				8 = Digital Error (unrecognized or corrupted digital signal)
				9 = DTS-ES Matrix
				10 = DTS-ES Discrete
				11 = DTS 96/24
				12 = DTS 96 Matrix
				13 = DTS 96 Discrete
	Current Input Method	1	238	EE
2		0...6	00...06	0 = Non-balanced Analog
				1 = Coaxial
			2 = Optical	
Late Night (DYN)	1	239	EF	
	2	0 or 1	00 or 01	0 = compression off, 1 = compression on
Cinema EQ	1	240	F0	
	2	0 or 1	00 or 01	0 = Cine EQ off, 1 = Cine EQ on
Treble Trim	1	242	F2	
	2	0...24	00...18	0 = -12dB, 12 = 0dB, 24 = +12dB
Bass Trim	1	243	F3	
	2	0...24	00...18	0 = -12dB, 12 = 0dB, 24 = +12dB
Center Trim	1	244	F4	
	2	0...24	00...18	0 = -12dB, 12 = 0dB, 24 = +12dB
Surround Trim	1	245	F5	
	2	0...24	00...18	0 = -12dB, 12 = 0dB, 24 = +12dB
Subwoofer Trim	1	246	F6	
	2	0...24	00...18	0 = -12dB, 12 = 0dB, 24 = +12dB
Trigger 1 Status	1	247	F7	
	2	0 or 1	00 or 01	0 = trigger inactive, 1 = trigger active





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## ▷ System Status and Feedback (continued):

Parameter	Data #	Decimal Code	Hex code	Description (Decimal)
Trigger 2 Status	1	248	F8	
	2	0/1		0 = trigger inactive, 1 = trigger active
Video Format	1	249	F9	
	2	0...2	00...02	0 = unknown, 1 = PAL, 2 = NTSC
THX Status	1	250	FA	
	2	0...5	00...05	0 = THX off, 1 = THX Cinema, 2 = THX Surround EX 3 = THX Ultra2, 4 = THX Music, 5 = THX Games

You can Query the unit for a full status report by issuing the command 227.

The data that comes back is organized in the following way.

For full data block break down, please refer to previous section on feedback.

**Please note** that you do **NOT** need to issue the RS enable command (224 82 83 33) before this command.

<b>Request Full Status Report</b>	1	227	E3	Crestron example in Hex is: \xE3
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Output data				Indicates Start of status Feedback
	1	223	DF	
	2	255	FF	Separates All Data Blocks
	3	225	E1	Main Volume
		226	E2	Mute Status
		227	E3	Current Source
		229	E5	Power Status
		230	E6	Current Zone Source
		232	E8	Zone Volume
		233	E9	Zone Mute Status
		234	EA	Dimmer Status
		236	EB	Surround Mode
		237	ED	Current Audio Type
		215	D7	Current Input Type
		238	EE	Current Input Method
		239	EF	Late Night Status
		240	F0	Cinema EQ
		250	FA	THX status
		243	F3	Bass Trim
		242	F2	Treble Trim
		244	F4	Center Trim
		245	F5	Surround Trim
		246	F6	Subwoofer Trim
		247	F7	Trigger 1 Status
		248	F8	Trigger 2 Status
		249	F9	Video Format