

THETA DIGITAL  
 Casa Nova Owners Manual Addendum  
RS232 Protocol and Control Details

## RS232 Hardware Connections

RTS and CTS are not  
 implemented in Casa Nova

### DB9

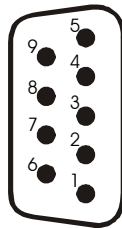
Pin	I/O	
1 - DCD	0	
2 - Casa Nova sends on this pin	0	
3 - Casa Nova receives on this pin	1	
4 - DTR	1	
5 - GND		
6 - DSR	0	
7 - RTS	1	
8 - CTS	0	
9 - Ring	---	

CN2

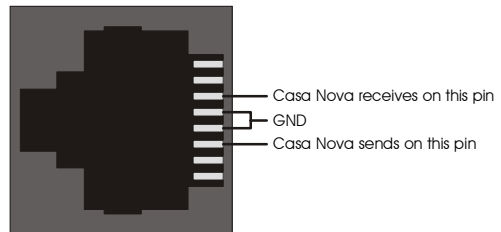
### RJ45

Pin	I/O	
1 - RTS	1	
2 - DTR	1	
3 - Casa Nova receives on this pin	1	
4 - GND		
5 - GND		
6 - Casa Nova sends on this pin	0	
7 - DCD	0	
8 - CTS	0	

CN3



Rear panel view of DB9 connector  
 (From outside of unit).



These are the connector drawings only. The RS232 cable must be a regular RS232 or mouse extender cable that are wired pin for pin.

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### RS232 Protocol and Control Details

RS232 settings will be user definable to accommodate interfacing with a wide range of control products.

Baud rate	1200 - 19200
Echo status	0 - 4

Baud rate: Maximum number of bits per second. The duration of a single bit is equal to 1 / baud rate.

Echo status: Specifies a "status level" to return to controlling device upon any operating change in Casa Nova. E.g. level 1 will return current mode, input, master level. Level 2 will return level 1 plus additional parameters, etc.

The above settings may be changed via the user interface LCD or OSD or may also be changed via the RS232 interface itself.

All commands will follow the format:

<Header><Command Identifier><Argument 1><Argument 2><Argument 3>

where:

<Header> = <FEh><EFh>

<Command identifier> = <byte>

<Argument x> = <byte>

Each command will be able to access the system configuration directly, eliminating the need to navigate through multiple layers of menuing to reach a given item.

Note: Casa Nova contains a menu that is accessible only through the RS232 port. Its text can be changed and then displayed at any time. This is useful for displaying company names, disc titles, caller ID, etc.

See commands 07h - 0Ah for specifics.

Input names and jack names can be read and changed via the RS232 port. This is useful when displaying this information on a touchscreen panel or other device, to keep Casa Nova and the device synchronized.

#### Examples:

1) To select input #3: Send FE, EF, 04, 05, 03, 00 (all values in Hex).

Where FE and EF are the header, 04 = do action, 05 = select input, 03 = input 3 and 00 = filler (4 characters required)

2) To change the crossover type for the currently selected input to Butterworth: Send FE, EF, 01, 0A, 00, 01

Where FE and EF are the header, 01 = variable change, 0A = crossover type, 00 = not global (is input) and 01 = Butterworth.

Sample AMX and Crestron Touchpanel graphics and programs are available from Glenn Buckley at Theta.

Please note: Hexadecimal numbers are followed by a "h", decimal numbers are followed by a "d".

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Command	Description	Argument 1	Argument 1 Description	Argument 2	Argument 2 Desc	Argument 3	Arg 3 Desc
01h	Variable Change	0-255d	Variable Number from include file	1=global, 0=by input	Global	0-255d	new value
02h	Full Mute	1d	Full mute (user mute inactive).				
		2d	Full unmute (user mute active).				
03h	Update Display	1d	Menu LEDs				
		2d	Menu Parameters				
		3d	Menu Display				
		4d	Re-display whole menu				
04h	Do Action						
		5d	Select Input	1-12d	Input number.		
		6d	User Mute	0d	Toggle mute.		
				1d	Mute.		
				2d	Unmute.		
		7d	Phase	0d	Go to phase menu.		
		8d	Go To Menu	0-255d	Menu # from include file.		
		9d	Change Display brightness	0d	Cycle LCD.		
				1d	Turn off LCD.		
				2d	Set LCD to 1/4.		
				3d	Set LCD to 1/2.		
				4d	Set LCD to full.		
		11d	Go To Volume	0-73d	New volume.		
		12d	Source change.	0d	Cycle source.		
				1-6d	Set source.		
		14d	Power main.	0d	Cycle standby.		
				1d	Put unit into standby.		
				2d	Take unit out of standby.		
		15d	Power remote	0d	Cycle rem power.		
		17d	Mode select	0d	Matrix		
			(Note: If in input select menu,	1d	Special matrix		
			this command should be followed	2d	Pro Logic		
			by "03 04 00 00" to update the	3d	Dolby Digital		
			display.)	4d	DTS		
				5d	Stereo		
				8d	Mono		
				9d	CS encoded		
				10d	CS non-encoded		
				11d	CS Cinema		
		25d	noise select speaker	1-6d	Speaker to select.		
05h	Get variable value	0-255d	Variable Number (see status levels)	1=global, 0=by input	Global		

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Command	Description	Argument 1	Argument 1 Description	Argument 2	Argument 2 Desc	Argument 3	Arg 3 Desc
06h	Return status	0-4d	Return specified status level.				
07h	Write LCD buffer address	0-39d	Address to write characters to.				
08h	Write char to LCD buffer.	0-7Fh	Character	0-7Fh (FF skips char)	Character	0-7Fh	Character
09h	Write OSD buffer address.	0-1h	Address high byte	0-255d	Address low byte	Addr high:Addr low <308	
0Ah	Write chars to OSD buffer.	0-7Fh	Character	0-7Fh (FF skips char)	Character	0-7Fh	Character
0Bh	Simulate Keypress		None				
		0d	None				
		1d	1				
		2d	2				
		3d	3				
		4d	4				
		5d	5				
		6d	6				
		7d	A/D				
		8d	Mute				
		9d	Mode				
		10d	Tape Out				
		11d	Setup				
		12d	Balance				
		13d	Display IR				
		14d	Power Main				
		15d	Up				
		16d	Down				
		17d	Power Remote				
		18d	Status				
		19d	Left				
		20d	Right				
		21d	Phase				
		22d	Select Up				
		23d	Select Down				
		24d	EQ				
0Ch	Change Jack Name LCD	1d	Analog 1	0-5d	Char to change	0-7Fh	new value
		2d	Analog 2				
		3d	Analog 3				
		4d	Analog 4				
		5d	Analog 5				
		6d	Analog 6				
		7d	Coaxial 1				
		8d	Coaxial 2				
		9d	Coaxial 3				

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Command	Description	Argument 1	Argument 1 Description	Argument 2	Argument 2 Desc	Argument 3	Arg 3 Desc
		10d	Coaxial 4				
		11d	Coaxial 5				
		12d	Coaxial 6				
		13d	AES/EBU				
		14d	TosLink 1				
		15d	TosLink 2				
		16d	Glass				
		17d	RF1				
		18d	RF2				
		19d	Composite 1				
		20d	Composite 2				
		21d	Composite 3				
		22d	Composite 4				
		23d	Composite 5				
		24d	Composite 6				
		25d	S-video 1				
		26d	S-video 2				
		27d	S-video 3				
		28d	S-video 4				
0Dh	Change Jack Name OSD	1-28d	same as above	0-19d	Char to change	0-7Fh	new value
0Eh	Change Input Name LCD	1-12d	Input	0-3d	Char to change	0-7Fh	new value
0Fh	Change Input Name OSD	1-12d	Input	0-14d	Char to change	0-7Fh	new value
10h	Read jack name	0d	LCD jack name	Jack # (same as Command 0C)			
		1d	OSD jack name				
11h	Read input name	0d	LCD input name	1-12d	Input number.		
		1d	OSD input name				
<b>Status Levels:</b>							
The RS232 can be set to automatically send changes to the RS232 port. This is done by selecting a "status level", which means if any Casa Nova parameter changes, that level's bytes will be sent to the port. This is useful for monitoring master level, input and the like when the user has access to both the Casa Nova and the touch-panel controller, to keep them synchronized.							

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Status level 0:	No status returned.					
Status level 1:						
Status Byte # (decimal)	Byte Description	Range (decimal)	Value Description			
1	input	1-12				
2	jack search	0-5				
3	master level	0-73				
4	mode	0	Matrix			
		1	Special matrix			
		2	Pro Logic			
		3	Dolby Digital			
		4	DTS			
		5	Stereo			
		6	Not used.			
		7	Not used.			
		8	Mono			
		9	Circle Surround Encoded.			
		10	Circle Non-encoded.			
		11	Circle Cinema			
5	Standby	0	Unit in standby.			
		1	Unit not in standby.			
Status level 2:	All status level 1 bytes plus:					
6	lock	0	no locked			
		1	locked			
7	sample rate	3	96KHz			
		4	88.2KHz			
		5	48KHz			
		6	44.1KHz			
		7	32KHz			
8	user mute	0	user mute not activated.			
		1	User mute activated.			
9	Display brightness	0	Off			
		1	1/4			
		2	1/2			
		3	Full bright.			
10	Analog Level	0	Clip			
		01h	-6 through -1			
		03h	-12 through -7			
		07h	-18 through -11			
		0Fh	Input level below -18			

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Status Byte #	Byte Description	Range	Value Description				
11	Remote power	0	both remote power lines are low.				
		1	Remote power 1 is high, two is low.				
		2	Remote power 1 is low, two is high.				
		3	Remote power 1 and 2 are both high.				
12	Current menu	0-x	Menu number.				
Status level 3:	All status level 1 and 2 bytes plus all global variables:						
Status Byte #	Global	Variable #	Variable Name				
13	TRUE	0	ANALOG_INPUT_LEVEL_1				
14	TRUE	1	BALANCE_CLEAR				
15	TRUE	2	BALANCE_ANALOG_INPUT_LEVEL				
16	TRUE	3	TAPE_OUT (Analog Source)				
17	TRUE	4	LEVEL_ZONE2				
18	TRUE	5	LEVEL_MASTER_INITIAL				
19	TRUE	6	PHASE				
20	TRUE	7	BALANCE_EQ				
21	TRUE	8	MAIN_TIME				
22	TRUE	9	ANALOG_INPUT_LEVEL_2				
23	TRUE	10	ANALOG_INPUT_LEVEL_3				
24	TRUE	11	MAIN_TYPE				
25	TRUE	12	ANALOG_INPUT_LEVEL_4				
26	TRUE	13	ANALOG_INPUT_LEVEL_5				
27	TRUE	14	MAIN_SOURCE				
28	TRUE	15	ANALOG_INPUT_LEVEL_6				
29	TRUE	16	TAPE_DIGITAL_SOURCE				
30	TRUE	17	REMOTE_PULSE_DURATION				
31	TRUE	18	TAPE_OUT_DIGITAL				
32	TRUE	19	TAPE_OUT_COMPOSITE_VIDEO				
33	TRUE	20	TAPE_OUT_S_VIDEO				
34	TRUE	21	RS232_DUPLEXING				
35	TRUE	22	RS232_BAUD_RATE				
36	TRUE	23	RS232_ECHO_COMMAND				
37	TRUE	24	RS232_ECHO_STATUS				
38	TRUE	25	AC3_STATUS_MODE				
39	TRUE	26	AC3_STATUS_CENTER_MIX				
40	TRUE	27	AC3_STATUS_SURROUND_MIX				

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Status Byte #	Global	Variable #	Variable Name				
41	TRUE	28	AC3_STATUS_COPYRIGHT				
42	TRUE	29	AC3_STATUS_DIALOG_NORM				
43	TRUE	30	AC3_STATUS_LANGUAGE				
44	TRUE	31	AC3_STATUS_ROOM_TYPE				
45	TRUE	32	REMOTE_POWER_TIME				
46	TRUE	33	REMOTE_POWER_SOURCE				
47	TRUE	34	REMOTE_POWER_TYPE				
48	TRUE	35	BALANCE_L_R				
49	TRUE	36	BALANCE_F_R				
50	TRUE	37	BALANCE_CENTER				
51	TRUE	38	BALANCE_SUBS				
52	TRUE	39	ANALOG_TAPE_OUT SOURCE				
Status level 4:	All status level 1-3 bytes plus all current input variable bytes:						
53	FALSE	0	CENTER_CONFIG				
54	FALSE	1	LR_BW_LOP_FREQ				
55	FALSE	2	CEN_PF_FREQ				
56	FALSE	3	CEN_PF_SLOPE				
57	FALSE	4	CEN_PF_LOP_PHASE				
58	FALSE	5	CEN_BW_HIP_SLOPE				
59	FALSE	6	CEN_BW_HIP_FREQ				
60	FALSE	7	CENTER_LOPASS_TO				
61	FALSE	8	PASSWORD_GLOBAL_SETUP				
62	FALSE	9	LR_CONFIG				
63	FALSE	10	CROSSOVER_TYPE				
64	FALSE	11	LR_PF_FREQ				
65	FALSE	12	LR_PF_SLOPE				
66	FALSE	13	LR_PF_LOP_PHASE				
67	FALSE	14	LR_BW_HIP_SLOPE				
68	FALSE	15	LR_BW_HIP_FREQ				
69	FALSE	16	SUR_CONFIG				
70	FALSE	17	SUR_PF_FREQ				
71	FALSE	18	SUR_PF_SLOPE				
72	FALSE	19	LR_LR_SLOPE				
73	FALSE	20	SUR_PF_LOP_PHASE				
74	FALSE	21	LR_LR_LOP_PHASE				
75	FALSE	22	SUR_BW_HIP_SLOPE				



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Status Byte #	Global	Variable #	Variable Name				
76	FALSE	23	SUR_BW_HIP_FREQ				
77	FALSE	24	DELAY_LEFT				
78	FALSE	25	DELAY_SL				
79	FALSE	26	DELAY_SR				
80	FALSE	27	DELAY_CENTER				
81	FALSE	28	DELAY_RIGHT				
82	FALSE	29	DELAY_SUB				
83	FALSE	30	CEN_BW_LOP_FREQ				
84	FALSE	31	CEN_BW_LOP_SLOPE				
85	FALSE	32	CEN_BW_LOP_PHASE				
86	FALSE	33	CEN_LR_FREQ				
87	FALSE	34	CEN_LR_SLOPE				
88	FALSE	35	SEARCH_6_S				
89	FALSE	36	LEVEL_LEFT				
90	FALSE	37	LEVEL_CENTER				
91	FALSE	38	LEVEL_RIGHT				
92	FALSE	39	LEVEL_SL				
93	FALSE	40	LEVEL_SR				
94	FALSE	41	LEVEL_SUB				
95	FALSE	42	SEARCH_6_COMPOSITE				
96	FALSE	43	SEARCH_1_S				
97	FALSE	44	SEARCH_2_S				
98	FALSE	45	SEARCH_3_S				
99	FALSE	46	SEARCH_4_S				
100	FALSE	47	SEARCH_5_S				
101	FALSE	48	CS_WIDE				
102	FALSE	49	CS_DELAY_CENTER				
103	FALSE	50	CS_LEVEL_CENTER				
104	FALSE	51	CS_DELAY_LS				
105	FALSE	52	CS_LEVEL_LS				
106	FALSE	53	DD_2CH_MODE				
107	FALSE	54	DD_COMPRESSION				
108	FALSE	55	DD_COMPRESSION_HIGH				
109	FALSE	56	DD_COMPRESSION_LOW				
110	FALSE	57	DD_DIALOG_NORMALIZATION				
111	FALSE	58	DD_LFE_GAIN				
112	FALSE	59	DD_DELAY_CENTER				
113	FALSE	60	DD_LEVEL_CENTER				
114	FALSE	61	DD_DELAY_LS				

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Status Byte #	Global	Variable #	Variable Name				
115	FALSE	62	DD_LEVEL_LS				
116	FALSE	63	DTS_LFE_GAIN				
117	FALSE	64	DTS_DELAY_CENTER				
118	FALSE	65	DTS_LEVEL_CENTER				
119	FALSE	66	DTS_DELAY_LS				
120	FALSE	67	DTS_LEVEL_LS				
121	FALSE	68	MODE_DEFAULT				
122	FALSE	69	CEN_LR_LOP_PHASE				
123	FALSE	70	LFE_PHASE				
124	FALSE	71	VIEW_AC3_INFO				
125	FALSE	72	SEARCH_1				
126	FALSE	73	SEARCH_2				
127	FALSE	74	SEARCH_3				
128	FALSE	75	SEARCH_4				
129	FALSE	76	SEARCH_5				
130	FALSE	77	SEARCH_6				
131	FALSE	78	VOLUME_FAST				
132	FALSE	79	VOLUME_SLOW				
133	FALSE	80	MUTE_LEVEL				
134	FALSE	81	LCD_BRIGHTNESS				
135	FALSE	82	NAME_LCD				
136	FALSE	83	NAME_OSD				
137	FALSE	84	OSD_BACKGROUND_COLOR				
138	FALSE	85	OSD_LEFT_EDGE				
139	FALSE	86	OSD_TOP_EDGE				
140	FALSE	87	OSD_CONFIG				
141	FALSE	88	OSD_DISPLAY_TIME				
142	FALSE	89	STATUS_MODE				
143	FALSE	90	STATUS_INPUT				
144	FALSE	91	STATUS_TAPE				
145	FALSE	92	STATUS_LEVEL				
146	FALSE	93	STATUS_EQ				
147	FALSE	94	STATUS_PHASE				
148	FALSE	95	STATUS_SOURCE				
149	FALSE	96	LR_LR_FREQ				
150	FALSE	97	SPATIALIZER_ON_OFF				
151	FALSE	98	LR_BW_LOP_SLOPE				
152	FALSE	99	SUBS_NUMBER				
153	FALSE	100	SUB_FULL_XOVER				

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Status Byte #	Global	Variable #	Variable Name				
154	FALSE	101	SEARCH_1_COMPOSITE				
155	FALSE	102	SEARCH_2_COMPOSITE				
156	FALSE	103	SEARCH_4_COMPOSITE				
157	FALSE	104	SEARCH_3_COMPOSITE				
158	FALSE	105	SEARCH_5_COMPOSITE				
159	FALSE	106	LR_BW_LOP_PHASE				
160	FALSE	107	SOURCE_NOISE1_NOISEALL				
161	FALSE	108	SUR_BW_LOP_FREQ				
162	FALSE	109	SUR_BW_LOP_SLOPE				
163	FALSE	110	SUR_BW_LOP_PHASE				
164	FALSE	111	SUR_LR_FREQ				
165	FALSE	112	SUR_LR_SLOPE				
166	FALSE	113	SUR_LR_LOP_PHASE				
167	FALSE	114	DD_DELAY_RS				
168	FALSE	115	DD_LEVEL_RS				
169	FALSE	116	DTS_DELAY_RS				
170	FALSE	117	DTS_LEVEL_RS				
171	FALSE	118	CS_DELAY_RS				
172	FALSE	119	CS_LEVEL_RS				
173	FALSE	120	PLL	0=Narrow, 1=Wide			
174	FALSE	121	MESSAGE	0=Off, 1=On			
<b>Character map (LCD)</b>							
		<b>Character</b>	<b>Code (hex)</b>				
		blank	20				
		□	FF				
		!	21				
		"	22				
		#	23				
		\$	24				
		%	25				
		&	26				
		'	27				
		(	28				
		(	7B				
		)	29				
		)	7D				
		*	2A				
		+	2B				

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	Character	Code (hex)				
	,	2C				
	-	2D				
	->	7E				
	.	2E				
	/	2F				
	:	3A				
	;	3B				
	<	3C				
	<-	7F				
	=	3D				
	>	3E				
	?	3F				
	?	3F				
	@	40				
	[	5B				
	]	5D				
	^	5E				
	_	5F				
	`	60				
		7C				
		7C				
	¢	EC				
	0	30				
	1	31				
	2	32				
	3	33				
	4	34				
	5	35				
	6	36				
	7	37				
	8	38				
	9	39				
	A	41				
	a	61				
	B	42				
	b	62				
	C	43				
	c	63				
	CG00	00				

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	Character	Code (hex)				
	CG01	01				
	CG02	02				
	CG03	03				
	CG04	04				
	CG05	05				
	CG06	06				
	CG07	07				
	CG08	08				
	CG09	09				
	CG10	0A				
	CG11	0B				
	CG12	0C				
	CG13	0D				
	CG14	0E				
	CG15	0F				
	D	44				
	d	64				
	E	45				
	e	65				
	F	46				
	f	66				
	G	47				
	g	67				
	H	48				
	h	68				
	I	49				
	i	69				
	J	4A				
	j	6A				
	K	4B				
	k	6B				
	L	4C				
	l	6C				
	M	4D				
	m	6D				
	N	4E				
	n	6E				
	O	4F				
	o	6F				



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		Character	Code (hex)			
		<--	7B			
		=	78			
		>	61			
		?	70			
		}	7D			
		0	00			
		1	01			
		2	02			
		3	03			
		4	04			
		5	05			
		6	06			
		7	07			
		8	08			
		9	09			
		A	0C			
		B	0D			
		blank	0B			
		C	0E			
		D	0F			
		E	10			
		F	11			
		G	12			
		H	13			
		I	14			
		J	15			
		K	16			
		L	17			
		M	18			
		N	19			
		O	1A			
		P	1B			
		Q	1C			
		R	1D			
		S	1E			
		T	1F			
		U	20			
		V	21			
		W	22			

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	Character	Code (hex)				
	X	23				
	Y	24				
	Z	25				
<b>Menus:</b>						
	Page Number	Page Description				
	0	Input Select				
	1	Mode 1				
	2	Mode 2				
	3	Tape Out				
	4	Setup 2				
	5	Setup				
	6	Input Select 2				
	7	Setup Input 1				
	8	Setup Input 2				
	9	Speaker Configuration				
	10	Config Left/Right				
	11	Config Center 1				
	12	Receiving 96KHz				
	13	Config Surrounds				
	14	Subs Config				
	15	Levels 1				
	16	Setup Video Composite Inputs				
	17	Delays 1				
	18	Setup Video S Inputs				
	19	Setup Input Search Order				
	20	Setup Dolby Digital 1				
	21	Setup Circle Surround				
	22	Setup On-Screen Display				
	23	Setup Status Display				
	24	Setup Miscellaneous				
	25	Setup Remote Power				
	26	Level Graphic				
	27	Password				
	28	Dolby Digital Info 1				
	29	Setup DTS				
	30	Dolby Digital Info 2				
	31	Setup Input 3				

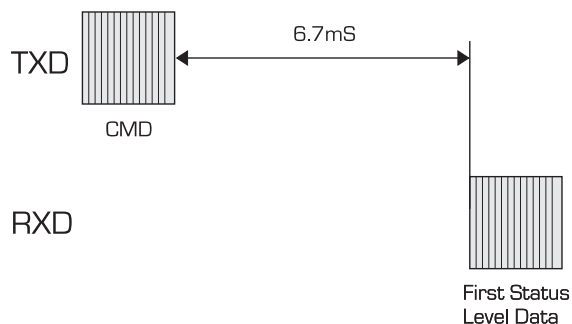


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		Page Number	Page Description				
		32	Setup Spatializer				
		33	Macros				
		34	Macro 1 - 1				
		35	Are you sure?				
		36	Receiving Dolby Digital				
		37	Receiving DTS				
		38	Status				
		39	RS232				
		40	Option not installed				
		41	Phase				
		42	Checking boards				
		43	Theta Digital				
		44	Setup Dolby Digital 2				
		45	Macro 1 - 2				
		46	Setup Input Jack Names, Digital 1				
		47	Setup Input Jack Names				
		48	Setup Input Jack Names, Digital 2				
		49	Setup Analog Input Levels				
		50	Setup Input Jack Names, Analog				
		51	Balance 1				
		52	Balance 2				
		53	Setup Input Jack Names, Video Composite				
		54	Setup Input Jack Names, Video S				
		55	Config Left/Right Phase Perfect				
		56	Config Left/Right Linkwitz-Riley				
		57	Config Left/Right Butterworth				
		58	Config Center Phase Perfect				
		59	Config Center Linkwitz-Riley				
		60	Config Center Butterworth				
		61	Config Surrounds Phase Perfect				
		62	Config Surrounds Linkwitz-Riley				
		63	Config Surrounds Butterworth				
		64	RS232 User Configurable				

Casa Nova Owners Manual Addendum  
RS232 Protocol and Control Details

The command to request a status level is 06 0x 00 00, where x= the status level. When this command is issued, there is a 6.7mS delay before the first status byte is received.



The ECHOS parameter in the Casa Nova determines what status levels of data are returned. The diagram below shows all 4 status levels returned and the delay times between them. Note there is no delay time between status level 1 and 2. In addition, this diagram shows the duration of each status level.

