

BRVSTON



SP3
OWNER'S MANUAL

IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.



WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.

DO NOT EXPOSE THIS EQUIPMENT TO DRIPPING OR SPLASHING AND ENSURE THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, ARE PLACED ON THE EQUIPMENT.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.

THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

BRYSTON LIMITED WARRANTY

Bryston analog audio products are warranted to be free from manufacturing defects for twenty (20) years from the original date of manufacture. The warranty includes parts and labour.

Bryston Digital products and cables are warranted for five years from the original date of manufacture. The warranty includes parts and labour.

Bryston products having motorized moving parts, excluding motorized volume controls, are warranted for three years from the original date of manufacture. The warranty includes parts and labour.

Bryston will remedy the problem by repair or replacement, as we deem necessary, to restore the product to full performance. Bryston will pay shipping costs one way (usually the return portion) during the first three years of warranty coverage.

In the event of a defect or malfunction, contact Bryston's repair centres for return authorization. Products must be returned using original packaging material only. Packing material may be purchased from Bryston if necessary. This warranty is considered void if the defect, malfunction or failure of the product or any component part was caused by damage (not resulting from a defect or malfunction) or abuse while in the possession of the customer. Tampering by persons other than factory authorized service personnel or failure to fully comply with Bryston operating instructions voids the warranty. This warranty gives you specific legal rights and you may also have other rights which may vary from province to province and country to country.

As of 2006-02-22 Bryston will only warranty Bryston products purchased through authorized Bryston dealers. Bryston products with a date code of 0608 or higher (date code format is "yyww", where "yy" is the two least significant digits of the year and "ww" is the week of the year) must be accompanied by a copy of the bill-of-sale from a Bryston authorized dealer to qualify for warranty service. The warranty is transferable from the original owner to a subsequent owner as long as a copy of the bill-of-sale from the original authorized Bryston dealer accompanies the re-sale. The copy of the bill of sale to any subsequent owner need ONLY include the Name of the Bryston Authorized Dealer and the Model and Serial number of the Bryston product. The warranty will only be honored in the country of the original purchase unless otherwise pre-authorized by Bryston.

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CANADA K9J 7Y4**

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FAX BRYSTON DIRECTLY:

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INTRODUCTION

Congratulations on your purchase of the Bryston SP3 pre-amplifier/processor. This product will provide you with the finest available signal control and DSP audio processing available. Like all Bryston products the SP3 has been carefully designed and engineered to deliver a lifetime of enjoyment.

The SP3 offers both pre-amplifier and digital decoding functions, and it is very important that you thoroughly read this manual BEFORE you install and use the SP3.

UNPACKING

Your SP3 was carefully packed at the factory to protect against any damage in shipping and handling. Carefully examine the packing and the unit for any signs of external damage or impact and report those to your dealer or Bryston prior to using the unit.

Bryston advises that you keep all packaging in the event that the unit may have to be returned for service.

ACCESSORIES

In the carton you should have found the following accessories in addition to the SP3:

- 1 Bryston SP3 Instruction Manual
- 1 IEC standard power cord
- 1 BR3 Infrared Remote Control unit with battery installed


SAFETY

It is important that you read and completely understand the safety instructions and warning on page one of this manual before installing or connecting the SP3 to any electrical power source.

QUICK START

- Plug into an appropriate power source using an approved IEC-60320 power cord with a C13 plug on the equipment end. Check the Data Plate (a 1.5" x .625" sticker containing the electrical ratings for your unit) located on the rear panel near the power inlet to confirm that the unit you have is rated for the electric power supply in your region.
- Connect suitable inputs & outputs to the SP3. If you are connecting a DVD player to an SPDIF or TOS-LINK input, connect it initially to SPDIF-1 or TOS-LINK INPUT-1 (which are the default assignments; these assignments can be changed at any time in *System Menu* → *Digital Sources*). If you are connecting to an HDMI input, use HDMI-1 which is as-


signed to the DVD buttons on the front panel and the remote control. The video signals carried on the HDMI cable are looped through to the HDMI outputs.

- The Status LED located above the Standby button  should be lit red a couple of seconds after the unit is plugged in. Press the Standby button & the red LED will extinguish & the alphanumeric display will come on, initially showing "Bryston Surround Processor 3".
- Within a second or two the status screen will be displayed showing four lines: Source (input source signal), IN: (input format), OUT: (output signal format) and Volume: (in decibels).




Before adjusting items in the menus described below it should be noted that the factory default settings should be suitable for most typical surround setups. In short, the factory defaults for the most fundamental settings are:

- *Speakers:* 5.1 (Source Setup, Spkr Sz)
- *Speaker Size:* small (Source Setup)
- *Subwoofer:* On (Source Setup)
- *Distance:* 2 meters (System Setup)
- *Speaker levels:* 0 (Source Setup)


- Press the right arrow menu navigation button  and you will be at the top of the main menu. When the cursor is pointing at SYSTEM SETUP and



you press the right arrow button  again you will move into the System Setup menu.

However, if you press the down arrow  first so that the cursor is pointing at SOURCE SETUP, then pressing the right arrow button will move you into the Source Setup menu.



- To back up, all the way to the startup screen if desired, just keep pressing the Left arrow button . For more information on the menu system, see pg 12

Owner's Manual Updates

The SP3 Owner's Manual is regularly updated. Check the Downloads - Technical section of Bryston's website at www.bryston.com for the latest revisions. Note: the revision number follows the document number, separated by a dash, and can be found in the bottom left corner of the last page of this and other Bryston Owner's Manuals.

FRONT PANEL

A: ALPHA NUMERIC DISPLAY

B: MENU NAVIGATION Buttons

C: FUNCTION & OPERATION Buttons

D: VOLUME CONTROL

E: HEADPHONE JACK

F: OUTPUT SELECT Buttons

G: INPUT SELECT Buttons

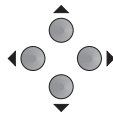
H: STANDBY Button

A: ALPHA-NUMERIC DISPLAY

This is a dot matrix display that can display graphics as well as 4 lines of alpha-numeric characters. The brightness of the display can be set in 4 steps from 25% to 100% using the *DISPLAY* button (see section "C" below). A default brightness level can also be set in the *System Setup* menu as can the automatic time-out period (from 30 to 600 seconds). When the timeout period expires the display will extinguish automatically. To reawaken the display press the currently illuminated Source Select button (section "G" below). Pressing any button or turning the rotary encoder (Volume control knob) will also wake up the display but will also effect a change (e.g. rotating the volume control clockwise will increase the volume, etc.).

B: MENU NAVIGATION BUTTONS

This cluster of 4 buttons are used to navigate the menus on the Alpha-numeric display. After the unit has powered up a status screen is displayed like that at the right. Press the right arrow button (▶) to enter the main menu. Use the left arrow button (◀) to step back up through the menus. The up (▲) and down (▼) buttons are used to move up and down through the menu items. The rotary encoder (volume control) can be used to set most parameters, even on/off choices. The two *Surround Mode* buttons can also be used to choose from preset value options. Up (▲) and/or down (▼) arrows may be displayed at the right hand side of the display to indicate that more items are listed either above and/or below the current screen. Use the up (▲) and (▼) down buttons to go to these items. See also **MENU MAP** on page 8



C: FUNCTIONS & OPERATIONS BUTTONS

▪ DISPLAY

Selects display brightness in four steps: 25%, 50%, 75% & 100%. To set an automatic timeout for the display to extinguish, set the options in the SYSTEM SETUP -> MISC. menu. Choosing DISP+LED TOUT instead of DISP TIMEOUT will apply the display timeout value to all front panel indicator LEDs as well as the dot-matrix display. Once a value for DISP+LED TOUT has been set the front panel DISPLAY button will also facilitate extinguishing all LEDs plus the dot-matrix display.

▪ SURROUND MODE

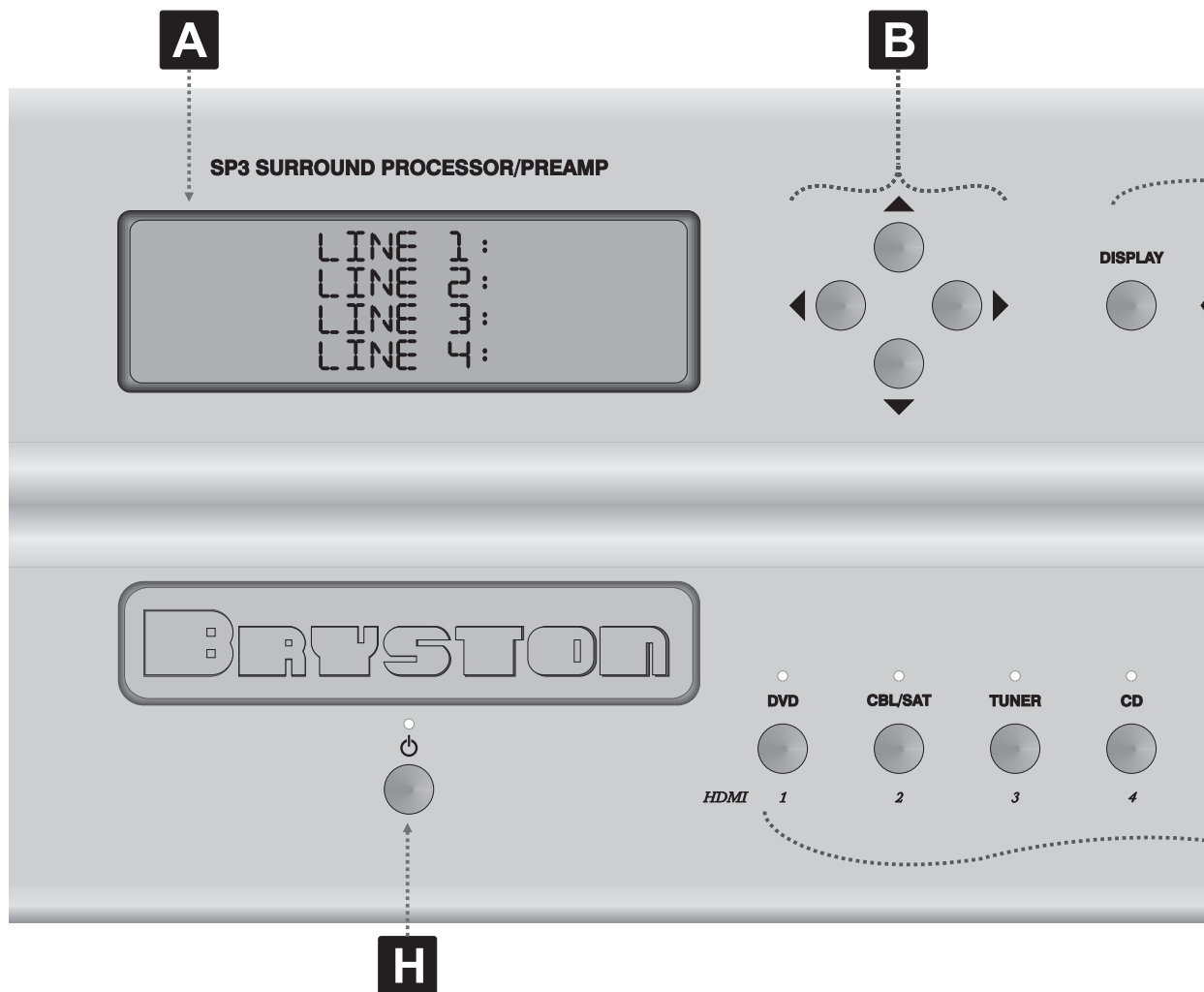
These Left & right Surround Mode (◀ & ▶) buttons allow for selection of up to 8 different surround modes including: PLIIx-Music, PLIIx-Movie, Neo-6 Music, Neo-6 Cinema, PLIIx-Natural, Pro Logic, Club, Party, Stereo-7. These modes derive surround modes from stereo (2 channel) analog DVD inputs. If a 5.1 surround signal is selected as the input, some surround modes can derive the 7.1 format Back channels from the left and right surround channels. These buttons can also be used to select values in the menu system. See Appendix for more information about the various surround modes.

▪ DIGITAL

Sets the source select button (G) to select from 1 of the 4 SPDIF inputs (RCA [phono] jacks, one of two AES

▪ HDMI

Sets the source select buttons (G) to select one of 8 HDMI inputs. The audio content will be processed through the SP3's DSP but the video content will simply be passed through to the two (parallel) HDMI outputs.



■ 2 CHANNEL BYPASS

Selects Left and right (or the front left and right) inputs from whatever analog source is currently selected. If the DIGITAL mode is active (i.e. if the LED above the DIGITAL button is ON) then this becomes a digital down-mix into a stereo Left and Right output.

■ STEREO & STEREO DOWN-MIX MODE

If this button is selected and the supplied bit-stream is more than 2 channels, the decoder will automatically implement a stereo down-mix. Otherwise, analog or digital two channel signals are passed as conventional stereo.

NOTE: *Down-mix is a software based automatic mixing function available within the SP3. This process exists because whenever the number of active decoder outputs or loudspeakers selected in setup is less than the number of channels in the Dolby Digital program, some channel combining will be neces-*

sary to present the program on the available number of channels/loudspeakers.

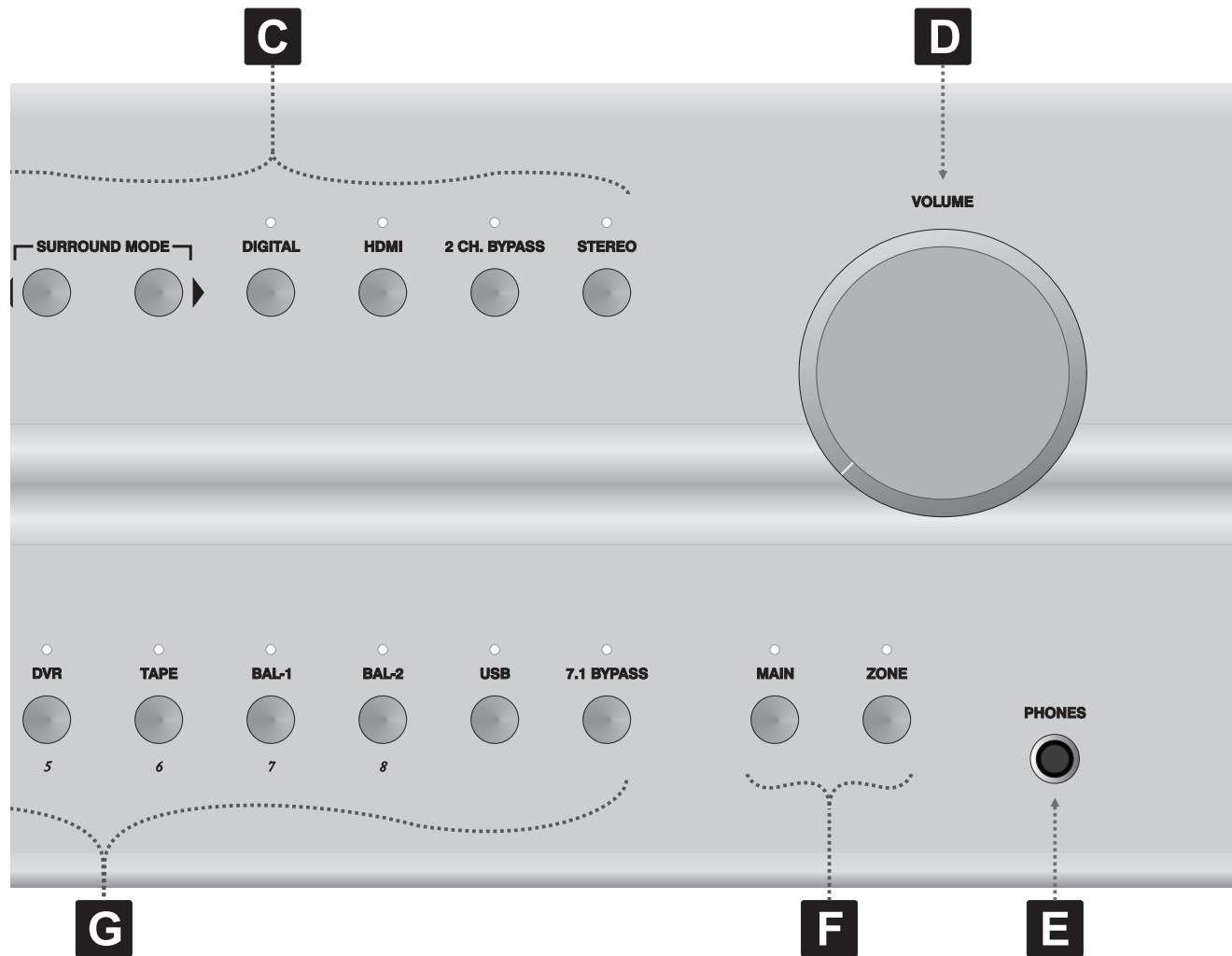
As a part of any program's production, its producers can set and adjust the type and ratios allowed for down-mixing somewhat to ensure optimum results without compromising the full Multichannel balance. This is accomplished by including specific data within the Dolby Digital bitstream which represents different mixing coefficients for the centre and surround channel signals.

These will be detected by the SP3 and used to produce the down-mix if this mode is selected.

D: VOLUME CONTROL / ROTARY ENCODER

Continuous rotary optical encoder for determining volume level as well as an input for most variable settings and other selections within both the *System* and *Source* menus.

Note that when the volume level is being adjusted the display changes to large numerals showing the level in decibels



E: HEADPHONE JACK

Stereo (3 conductor) 1/4" headphone jack. In 2 Channel Bypass mode the Left and Right analog inputs appear, amplified, at the headphone jack. When other sources are selected a stereo down-mix is used.

F: MAIN / ZONE SELECT

The SP3 can send a different **stereo** audio source signal to its ZONE outputs (Zone 2 Out) than to its main outputs (Single Ended Outputs or Balanced Outputs). Pressing the MAIN button allows selection of the signal that will go to the Single Ended Outputs and Balanced Outputs using the source select buttons (item "G") while pressing ZONE allows the same source select buttons to set the signals that will be sent to the Zone 2 Out outputs)

G: SOURCE (INPUT) SELECT BUTTONS

Ten buttons for selecting audio input source signals (see "F" above). When HDMI is selected (LED

above HDMI button is ON) the first 8 source select buttons (*DVD, CBL/SAT, TUNER, CD, DVR, TAPE, BAL-1, BAL-2*) represent HDMI inputs 1 through 8 respectively. When *MAIN* is selected, source signal selected will appear at the *MAIN* outputs. When *ZONE* is selected, the source signal selected will appear at the *ZONE 2 OUT* outputs

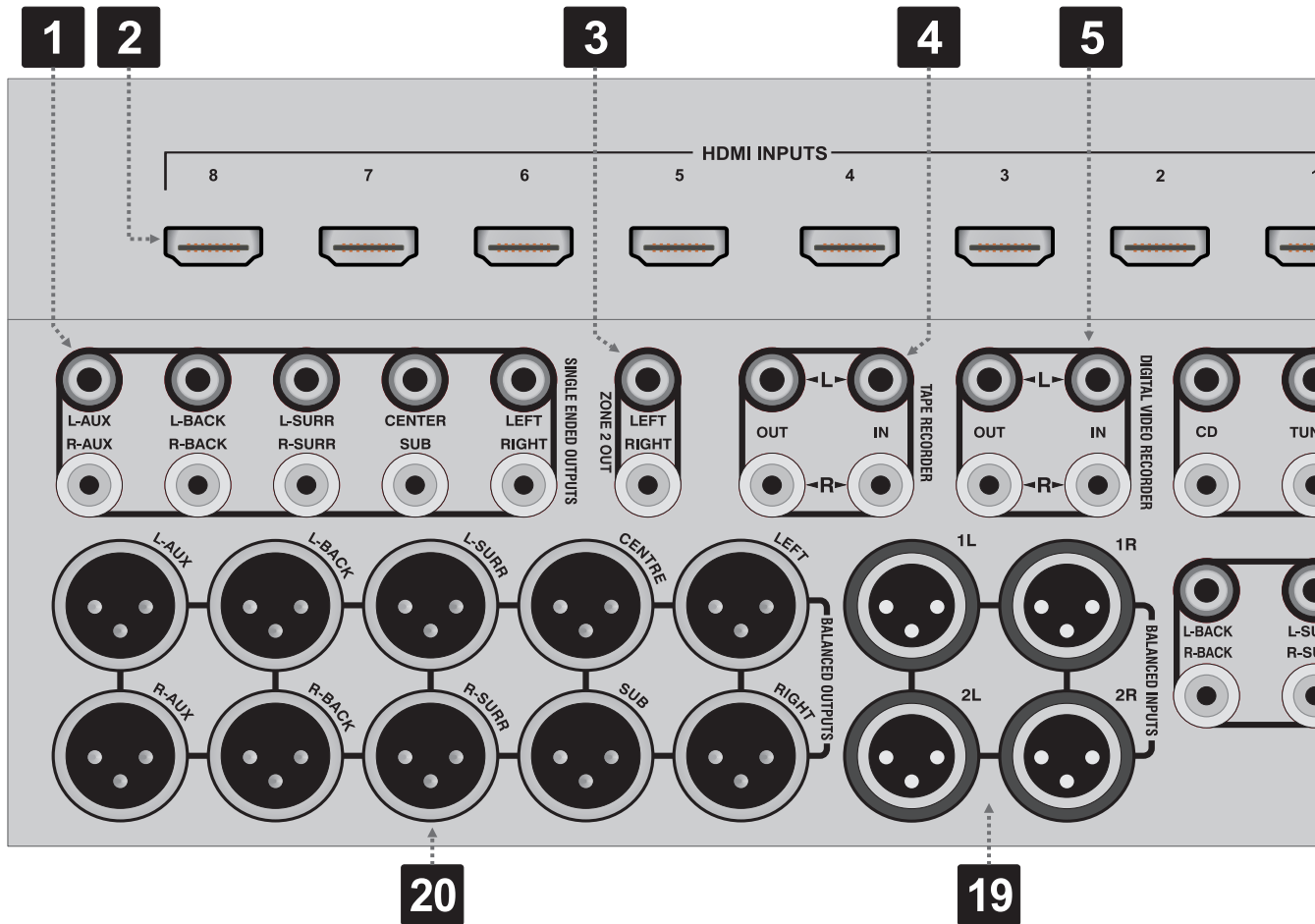
H: STANDBY BUTTON

Places the unit in standby mode. Status indicator LED is normally off when unit is operating. It turns red when unit is placed in standby mode. When uploading new software it may blink off and on in different colours. The specifics of these different colour states is significant only to engineering and service personnel.

Power consumption in Standby mode is <1 Watt.

REAR PANEL

- | | |
|---|---------------------------------------|
| 1: SINGLE ENDED ANALOG OUTPUTS | 6: SINGLE ENDED ANALOG INPUTS |
| 2: HDMI INPUTS | 7: SPDIF INPUTS |
| 3: ZONE-2, SINGLE ENDED, ANALOG OUTPUTS | 8: <i>DATA PLATE LABEL</i> |
| 4: 1st ANALOG TAPE LOOP IN/OUT CONNECTORS | 9: CAUTION, RECYCLING & OTHER SYMBOLS |
| 5: 2nd ANALOG TAPE LOOP IN/OUT CONNECTORS | 10: IEC-320 C14 POWER INLET |



1: SINGLE ENDED ANALOG OUTPUTS

The SP3 offers both balanced (3 pin XLR male connectors [pin 2+, pin 3-] and unbalanced (RCA/phono jacks) output connectors.

2: HDMI INPUTS

Although the SP3 uses only the audio signals carried on an HDMI cable, the video signals are routed to the two parallel HDMI outputs from the selected HDMI input.

3: ZONE 2 SINGLE ENDED ANALOG OUTPUTS

A pair of RCA jacks that provide a second stereo signal path completely separate from the main output with its own independently selected inputs

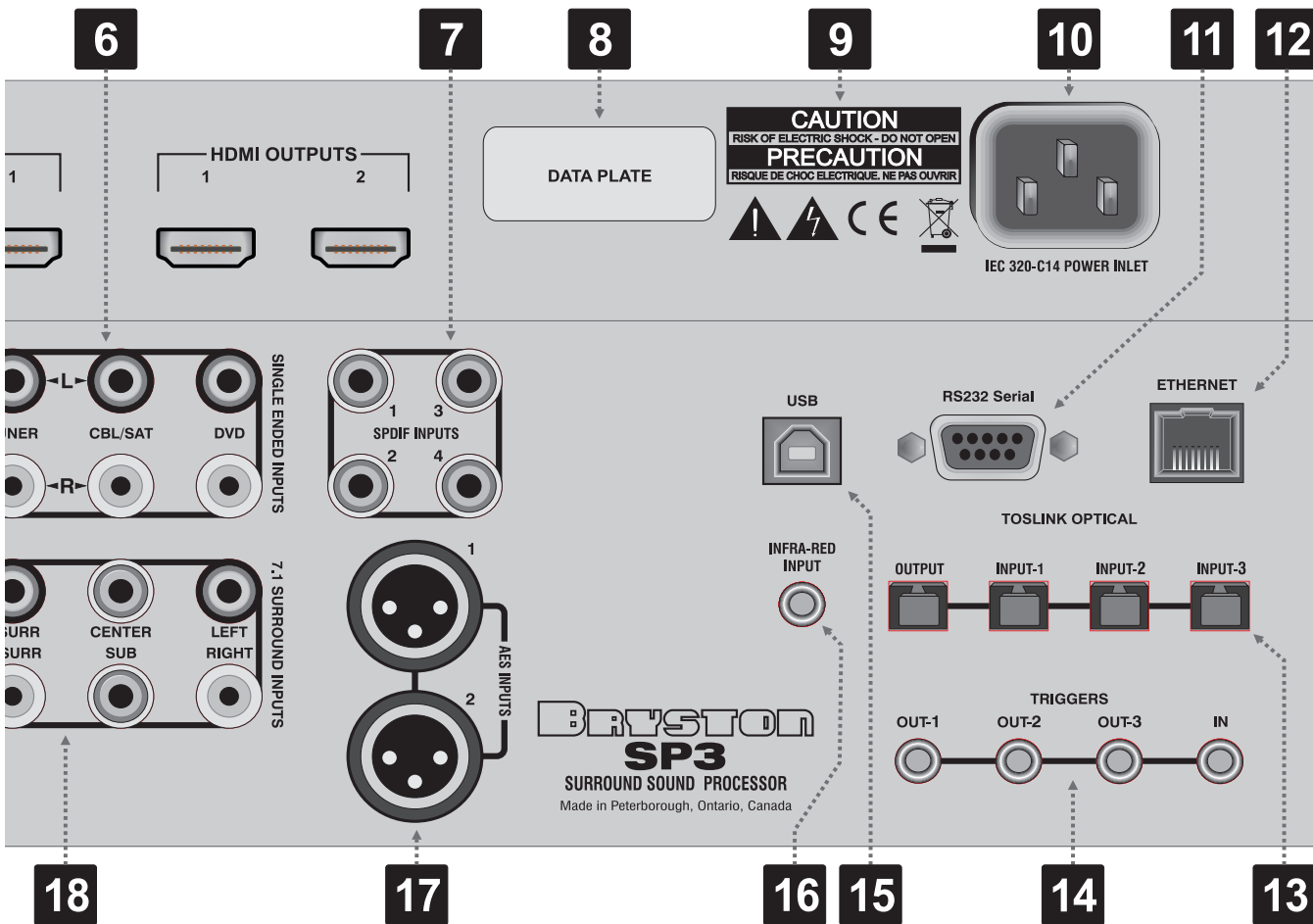
4: TAPE RECORDER TAPE LOOP

A conventional tape loop consisting of two pairs of RCA jacks; one stereo pair of inputs and one stereo pair of outputs. A stereo down-mix for the selected source (or, in 2 Channel Bypass mode, the Left and Right analog inputs directly) appear at the TAPE OUTPUTS, unless the selected source is the TAPE INPUT itself in which case the TAPE OUTPUTS are muted. The inputs can, of course, also be used as just another pair of analog inputs, but at unity gain only & no volume control.

5: DIGITAL VIDEO RECORDER TAPE LOOP

A second tape loop which functions just like the *Tape Recorder Tape Loop* above.

- 11: RS232 SERIAL PORT (DB9)
- 12: ETHERNET PORT (RJ45)
- 13: *TOSLINK* OPTICAL IN/OUT CONNECTORS
- 14: TRIGGER INPUT/OUTPUT CONNECTORS
- 15: USB PORT (USB 2.0 type B)
- 16: AUXILIARY INFRA-RED HARD WIRED INPUT
- 17: AES/EBU DIGITAL INPUTS (3 pin XLR female)
- 18: SINGLE ENDED 7.1 ANALOG SURROUND INPUTS
- 19: BALANCED ANALOG INPUTS (3 pin XLR female)
- 20: BALANCED 7.1 + 2 ANALOG OUTPUTS (XLR male)



6: SINGLE ENDED ANALOG INPUTS

Four pairs of general purpose analog inputs labelled CD, TUNER, CABLE/SAT, & DVD. Input voltage should be limited to less than or equal to 5V_{RMS} in addition. In stereo bypass mode the input voltage should be limited to ≤ 8V_{RMS}

7: DIGITAL AUDIO COAXIAL INPUTS

The TV/SAT, DVD, CD, and AUX front panel selectable sources are also supplied with a standard SPDIF gold RCA jack digital audio input. These four inputs will accept any standard SPDIF source including DAT, CDR and similar components.

8: DATA PLATE

Model name, electrical rating, date code (when manufactured), serial number & revision number.

9: CAUTION LABEL

Risk of shock electric shock ~ do not open. Refer servicing to qualified personnel. Note, however, that the SP3 does contain two 5x20mm glass fuses on the upper deck power supply board. Refer to FUSES sections on the next page for more information.

10: IEC-320 C14 POWER INLET

Mates with C13 power cord connector. Determine the correct operating voltage from the DATA PLATE and connect to an appropriate power source using an approved power cord.

11: RS232 SERIAL PORT (DB9)

Serial data port utilizing a DB9 female connector. For connection to system control systems such as *Crestron* and *AMX*.

12: ETHERNET PORT (RJ45)

For interconnections to personal computers (and/or routers) to facilitate SP3 software updates and also for control functions through audio system controls (*Crestron*, *AMX*, etc.) and computer control applications. This acts as an HTTP server. See Appendix H for more r

13: TOSLINK DIGITAL AUDIO OPTICAL INPUTS

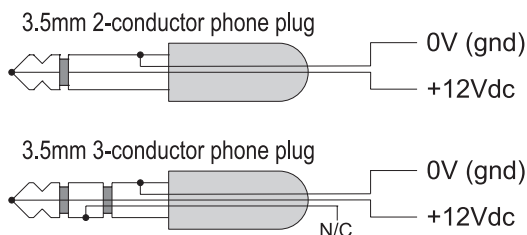
The SP3 offers two assignable TOSLINK optical inputs. These can be designated to any input using the OS menu ("Other Settings") on the LCD screen. Please note that if you choose to assign an optical input to an input with a coaxial input, the coaxial will be over-ridden and the optical input signal will be used by the SP3.

The pro model replaces the two TOSLINK connectors with a single AES/EBU Digital connector.

14: TRIGGER INPUTS & OUTPUT

Four 3mm two-conductor phone jacks with the tip being positive and the sleeve being negative. A voltage of between 3 and 12V on the trigger input will turn the SP3 on. Removing the trigger voltage will cause the SP3 to turn off. The input voltage can be of either polarity, that is, the phone plug tip can be positive and the sleeve negative, or visa versa

Remote Trigger Hookup Options



The three outputs can be programmed to go either high (+12Vdc, $\pm 0.6V$) or low (gnd) when specified inputs are selected. These assignments are found in the SOURCE menu (SOURCE → TRIGGERS).

A delay can also be specified (in the SYSTEM → MISC → TRIGDELAY menu) to delay the time when the trigger output goes to the chosen state (high or low) after an assigned input has been selected. See

also Refer to the Menu Tree on page 14

15: USB 2.0 TYPE A INPUT

Used as a digital audio input and as a control input for certain audio control systems.

16: AUXILIARY INFRA-RED INPUT

A 3mm two conductor phone jack which will accept a hardwired DC voltage that is the electrical equivalent of the optical signal generated by an infrared emitter in a remote control. This will primarily be used as by infra-red remote control extenders. The tip is positive, the sleeve is negative and the signal level should be 5vdc max. (Positive or "1") and 0v or ground (negative or "0")

17: AES/EBU BALANCED DIGITAL INPUT

Two 3 pin female XLR jacks for digital audio inputs conforming to the Audio Engineering Society/European Broadcasting Union standard formalized as the IEC 60958 standard using 110 Ohm shielded twisted pair wire.

18: SINGLE ENDED (UNBALANCED) 7.1 SURROUND SOUND INPUTS

Eight RCA jacks for connecting single-ended analog surround signals to the SP3; Front-Left, Front-Right, Front-Centre, Left Surround, Right-Surround, Back-Left, Back-Right & Sub-woofer.

19: BALANCED ANALOG INPUTS

Four XLR female jacks (2 left/right pairs) referred to as Balanced Input #1 and Balanced Input #2. These inputs conform to the EIA RS-297 standard wherein pin #1 is ground (chassis & shield), pin #2 is positive and pin #3 is negative.

20: BALANCED ANALOG AUDIO 7.1 + 2 SURROUND SOUND OUTPUTS

Ten 3-pin XLR male connectors conforming to the EIA RS-297 pinout (pin #1 = ground, pin #2 = positive and pin #3 = negative). In addition to the usual eight 7.1 outputs (Front-Left, Front-Centre, Front-Right, Surround-Left, Surround-Right, Surround-Rear-Left, Surround-Rear-Right and SubWoofer) there are two Auxiliary outputs (L-Aux and R-Aux). The signals present on these outputs can be programmed in the SYSTEM → MISC → AUX menu.

The two options are:
 Stereo L+R : This puts a stereo down-mix signal on the two AUX output jacks, the same stereo down-mix that appears on the headphone jack.
 Centre & Sub: This options puts the Centre channel onto the L-AUX connector and

the SUB channel onto the R-AUX connector thus facilitating the use of two sub-woofers and/or two centre channel speakers. See the illustration "Suggested Surround Speaker Placement" on page 18



FUSES

There are two 5x20mm glass fuses located on the upper deck power supply board as shown below. One fuse is for the standby power supply and the other is for the main power supply transformer. The values for these two fuses are as follows:

<p>F1: MAIN FUSE 120Vac models: F 1.6A 250V (Littelfuse 217 01.6) 220-240Vac models: T 1A 250V (Littelfuse 218 001)</p>	<p>F2: STANDBY FUSE For both 120Vac & 230Vac models: F 500mA 250V (Littelfuse 217.500)</p>
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120Vac models 220-240Vac mod-

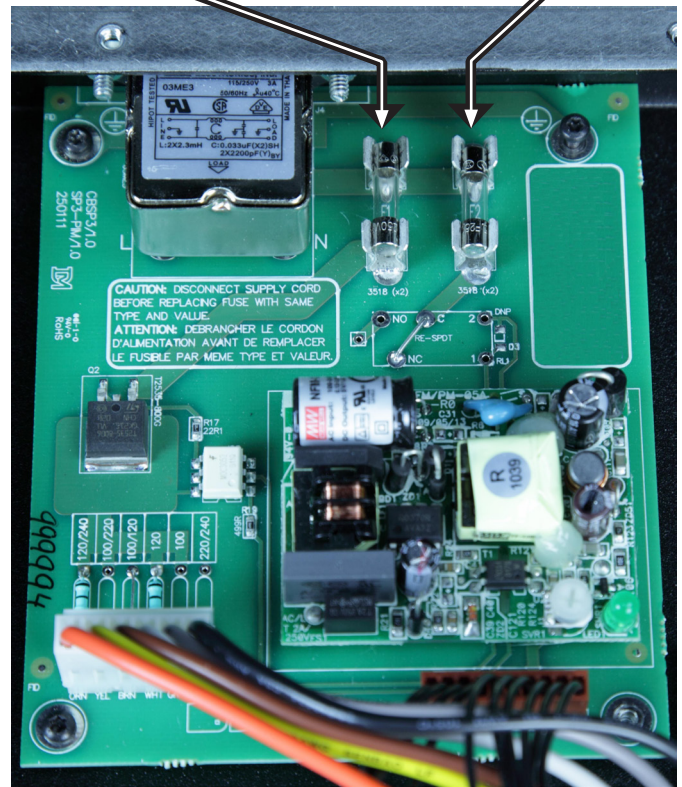
els

Stand-by fuse (F2): F 500mA 250V F 500mA 250V
 Part numbers: Littelfuse 217.500 Littelfuse 217.500

Main PSU fuse (F1): F 1.6A 250V T 1A 250V
 Part numbers: Littelfuse 217 01.6 Littelfuse 218 001

Before attempting to change fuses, disconnect all cables from the SP3, especially the power cord. Then remove all the screws from the top and left & right sides that hold the top cover in place. Remove the top cover by sliding towards the back of the unit and then lifting up. Be sure to replace all screws when replacing the top cover using no more that 16 inch-pounds of torque.

When removing screws from top cover use only the proper driver, a Torx #8, and do not use excessive force as it may damage the screw head. If the screw does not move tap *lightly* with a hammer to loosen the threads. If this doesn't work, please refer the unit to qualified service personel.



IR REMOTE CONTROL

The SP3 Remote Control can operate all front panel operations in addition to having a MUTE button to for quickly silencing the output of the SP3.

Several other functions are accessible by sending 3 digit numeric codes to the SP3. To send codes to the SP3:

- 1: Press and hold the CODE button until the status LED on the remote (located between the CODE and POWER buttons) flashes a couple of times & then stays lit steadily red; then release
- 2: Within a few seconds, while the status LED remains steadily lit, enter the desired 3 digit numeric code (see the table below for valid codes). Refer to the

BR3 illustration below for the location of the number keys on the remote.

- 3: When a valid code has been entered the LED will flash twice to confirm that the code has been accepted.

Certain features in the remote control itself can also be programmed by entering codes as described above. The only difference is that these codes affect only the BR3 remote control itself and are not sent to the SP3. These codes are as follows:

- 792: Toggle motion sensor on/off (backlight control)
- 797: Toggle backlight on/off

Function	Code	Function	Code
Power Off (Standby)	0	Sub in Bypass toggle	60
Source TV/SAT	1	SurrEff2 None	64
Source DVD	2	SurrEff2 Pro-Logic	65
Source CD	3	SurrEff2 NonePLII Music	66
Source TUNER	4	SurrEff2 PLII Movie	67
Source DVR	5	SurrEff2 Neo-6 Music	68
Source TAPE	6	SurrEff2 Neo-6 Movie	69
Volume Up	7	SurrEff2 Stereo 7	70
Volume Down	8	SurrEff Party	71
Mute Main or Zone tog	9	SurrEff2 Hall	72
Pink Noise Test	10	SurrEff2 Church	73
Digital toggle	11	SurrEff2 Stadium	74
Dolby EX Force/Auto	12	SurrEff Club	75
Stereo toggle	13	SurrEff2 Theatre	76
Zone/Zmute toggle	14	SurrEff2 Natural	77
Power/Standby toggle	15	SurrEff7 DD 5.1	78
DTS ES Force/Auto	16	SurrEff7 DD EX Movie6	79
Surround On	17	SurrEff7 PLIIx Music6	80
Surr Right arrow/Mode	18	SurrEff7 PLIIx Movie7	81
Menu Up arrow	19	SurrEff7 PLIIx Music7	82
Menu Down arrow	20	SurrEff7 PLIIx AUTO	83
Select button	21	SurrEff2 Stereo7x	84
Centre Speaker	22	HDMI toggle	85
Rear Speaker	23	Source BAL1	86
Back Speaker	24	Source BAL2	87
Subwoofer Speaker	25	Source USB	88
Save Config	26	Main/Mmute toggle	89
2-Ch Bypass toggle	27	n/a	90-93
Source 7.1 Bypass	28	Surr Left arrow	94
Power On	29	Surr Right arrow	95
n/a	30-48	Menu Left arrow	96
OSD On/Off	49	Menu Right arrow	97
OSD Off	50	n/a	98-221
OSD On	51	HiddenMenuUnlock	222
MONO On	52	n/a	223-237
2-Ch Bypass On	53	Reserved	238
Source 7.1 Bypass	54	Reserved	239
2-Ch Bypass Off	55	DISPLAY toggle	240
Digital On	56	n/a	241-244
Digital Off	57	TEST LEDs & DISP	245
Mute Main or Zone On	58	n/a	246-254
Mute Main or Zone Off	59	System RST&REBOOT	255

BACKLIGHT OPERATION

When enabled, the backlight will only come on when the ambient light falls below a predetermined level. If the motion detector (code 792) is disabled then the backlight will come on only when a button is pressed AND the ambient light level is low enough. If both the backlight and the motion detector are both enabled the backlight will come on when the unit experiences movement and/or when any of the buttons are pressed AND the ambient light is low enough.



MENU TREE

SYSTEM SETUP	SPEAKER DISTANCES	L (left)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		C (centre)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		R (right)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		Rs (right surround)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		Rb (right back)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		Lb (left back)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		Ls (left surround)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
		SUB (sub-woofer)	0→9.0m, 0→355 in., 0→30 ft., 0→26msec.
	DIGITAL SOURCES	DVD	SPDIF 1→4, OPTO 1→3
		SAT	SPDIF 1→4, OPTO 1→3
		TUNER	SPDIF 1→4, OPTO 1→3
		CD	SPDIF 1→4, OPTO 1→3
		DVR	SPDIF 1→4, OPTO 1→3
		TAPE	SPDIF 1→4, OPTO 1→3
	MISCELLANEOUS	BRIGHTNESS (of display)	25%, 50%, 75%, 100%
		HEADPHONES	-12 dB → +6 dB
		PRESET VOLUME	-60 dB → +10 dB
		AUX OUTPUTS	Stereo L+R, Center & SubWoofer
		AUTO SAVE	ON, OFF
		DISPLAY TIMEOUT	2, 10, 30, 120 minutes
SPEAKER DISTANCE UNITS		meters, feet, inches, milli-seconds	
TIGGER DELAY		0, 5, 10, 15, 20, 25, 30 seconds	
DHCP		Server, Client & Server, Static IP, Client, Auto IP	
IP address (read only)			
IP mask		255.0.0.0 → 255.255.255.192	
TESTS		PINK NOISE	AUTOCYCLE, MANUAL

SOURCE SETUP	SPEAKER SIZE	FRONT	Large, Small
		CENTER	Large, Small, None
		SURROUND	Large, Small, None
		BACK	Large, Small, None, 1 Sm, 2 Sm, 1 Lrg, 2 Lrg
	SPEAKER LEVEL	L (left)	-12 dB → +12 dB
		C (centre)	-12 dB → +12 dB
		R (right)	-12 dB → +12 dB
		Rs (right surround)	-12 dB → +12 dB
		Rb (right back)	-12 dB → +12 dB
		Lb (left back)	-12 dB → +12 dB
		Ls (left surround)	-12 dB → +12 dB
		SUB (sub-woofer)	-12 dB → +12 dB
	CROSSOVER	FRONT	40 → 200 Hz.
		CENTER	40 → 200 Hz.
		SURROUND	40 → 200 Hz.
		BACK	40 → 200 Hz.
	SUBWOOFER	SUB WOOFER	ON, OFF
		in2Bypass	ON, OFF
		XTRA BASS	ON, OFF (for Lrg front spkrs), DISABLE (for sm front spkrs)
	TRIGGERS	TRIGGER #1	ON, OFF
TRIGGER #2		ON, OFF	
TRIGGER #3		ON, OFF	
DTS	ES APPLY	FORCE, AUTO	
	Neo:6 Center	0 → 1.0 (0.3 = default)	
DOLBY	PLII Music Pan (Panaramic)	ON, OFF	
	PLII Music Cen (Centre)	0 (C max), 1, 2, 3 (L,C,R), 4, 5, 6, 7 (no ctr)	
	PLII Music Dim (Dimension)	4 (back), 5, 6, 7 (neutral), 8, 9, 10 (front)	
	EX apply	FORCE, AUTO	
OTHER	HDMI OUT	Loop through, Down mix	
	DIGI OUT	ZoneDAC, TOSLINK	
	LIPSYNC	0 → 255 mSec	
	PCM ZR (zero run)	Full, Gapless, Disable, Auto, Default2	

MENU TREE

NOTES

SYSTEM SETUP MENU:

SPEAKER DISTANCES:

Units for speaker distances are set in the SYSTEM > MISC. menu. Speaker distances are measured as radii from the listeners position. See the illustration SUGGESTED SURROUND SPEAKER PLACEMENT on page 18.

DIGITAL SOURCES:

Each of the Source Select buttons, on the front panel and on the remote control (DVD, CBL/SAT, TUNER, etc) can be programmed to select a digital input from one of the four co-axial SPDIF inputs or one of the 3 TOSLINK optical inputs.

MISCELLANEOUS:

HEADPHONES:

The signal level at the headphone jack can be adjusted from -12 dB to +6 dB to match headphone level more closely to the speaker listening levels

PRESET VOLUME:

The volume level at power-up can be pre-set to anywhere between -60 and +30dB

AUX Outputs:

The *L-AUX* and *R-AUX* auxilliary output jacks (XLR -male balanced) can be set, by this menu item, to be either another Left/Right stereo pair of outputs or another sub-woofer and another centre channel surround outputs.

As a stereo pair, the signal is analog if the SP3 is in **2 CHANNEL BYPASS** mode or otherwise it is a digital downmix from multi-channel inputs.

As set to provide another sub-woofer and centre channel output, the signals for these channels are the same as the signal that would be present on the main Sub-woofer and Centre channel outputs connectors. These simply provide a convenient way of using two centre channel speakers and/or two sub-woofer speakers.

AUTOSAVE:

When enabled (ON) settings are saved whenever you backup through the menu by pressing the left arrow button (◀). If Autosave is OFF settings will NOT be saved unless the SAVE button is pressed on the remote control.

TRIGGER DELAY:

The SP3 can be set to produce a 12Vdc trigger signals on any of the three *Trigger Output* jacks. See item 14 on page 9 (*TRIGGER INPUTS & OUTPUTS*). The tip of the two conductor (3mm) phone jack is positive and the sleeve is ground (0v).

TESTS (Pink Noise):

Will put a burst of pink noise, sequentially, on all speakers while displaying which output the test signal is being sent to. This is intended to help you verify that the connections and speaker levels are correct. Within the System Setup → Test menu, move the cursor to select *PINK NOISE* and press the right arrow button (▶) to initiate the test (and the left arrow button (◀) to stop it, if desired). The auto-cycling will stop on its own once all outputs have been sent a pink noise burst. To operate the pink noise test manually from the front panel, press the right arrow button again each time you wish to advance through the outputs, sequentially putting pink noise bursts on one speaker after another. In this case the noise test switches to "manual" mode and each channel will play until the right or left arrow is pressed again. Pressing the left arrow button will exit the test sequence.

To use the BR3 remote control to initiate the test press the *TEST* button on the remote. To change from *AUTOCYCLE* to *MANUAL* press the TEST button again. To advance the channel from the remote press right arrow again; to exit press left arrow button.

The volume control can be used to adjust the output levels during the test.

SOURCE SETUP MENU:

SPEAKER SIZE:

Large speakers are assumed to be able to handle all frequencies down to at least 40 Hz. A speaker defined as **SMALL** has the low frequencies filtered out. The default crossover point for the low frequencies is 80 Hz but this can be changed in software (SOURCE SETUP

MENU TREE NOTES continued:

> CROSSOVER) from 40 to 200 Hz.

The speaker size menu also allows for turning the CENTRE, SURROUND & BACK speakers off by selecting NONE. Also, the BACK speaker setting allows for

choosing from one or two back speakers. By turning the BACK speakers off, the surround sound speaker configuration becomes "5.1". By choosing only 1 BACK speaker the configuration becomes "6.1".

SPECIFICATIONS

PERFORMANCE SPECIFICATIONS

A/D Conversion: 24-Bit, 192 kHz Delta-Sigma

D/A Conversion: 24-Bit, up to 192 kHz Delta-Sigma

DSP Engine: TI DA710

Power Supply: Separate off-line standby PSU plus & main linear power supply with toroidal power transformer utilizing multiple regulation stages.

Frequency Response: 20 Hz to 20 kHz +/- 0.25 dB

Low Frequency Cutoff:

0.3 Hz (all speakers channels in Bypass mode)

1.8 Hz (LARGE Speakers and SubWoofer in Analog, Digital or HDMI)

40-200 Hz (variable cutoff point; default 80 Hz) SMALL speakers, except SubWoofer, in Analog, Digital or HDMI)

High Frequency Cutoff:

40-200 Hz (variable cutoff point; default 80 Hz) (SubWoofer in Analog, Digital or HDMI)

22 kHz (all speakers, except SubWoofer, in Analog, Digital or HDMI)

180 kHz (all speaker channels in BYPASS)

THD+Noise: < 0.006% in DSP modes; < 0.0025% in Bypass mode 20Hz to 20kHz at maximum output level.

Signal-to-Noise Ratio: 105dB in DSP Modes; 110dB in 2ch Bypass Mode; 22 kHz bandwidth, Ref. 1 kHz at max. output

Input Level: 2 Vrms in DSP modes; 4 Vrms in Bypass Mode

Input Impedance: 50 kOhms for single-ended analog audio, 1K Ohms for balanced analog inputs

Output Level: 8 Vrms (16 Vrms Balanced) in DSP Modes; 10 Vrms (20 Vrms Balanced) in Bypass Mode.

Output Impedance: 110 Ohms

Bass Management: 2nd Order HP filter(x5), 4th Order LP filter 40 – 200 Hz Crossover Freq.

ELECTRICAL SPECIFICATIONS:

Power: 120VAC & 230VAC models.

Maximum power consumption: 60 Watts

Standby power consumption: <1Watt

INPUTS

Analog Audio: 4x stereo single ended/unbalanced pairs (CD, Tuner, Cable/Sat, DVD)

2x pairs single ended, unbalanced tape inputs (RCA)

2x pairs of Balanced XLR (female) inputs

Digital Audio: 4x coaxial (RCA) 75 Ohms (SPDIF),
3x Optical (TOSLINK)
2x AES/EBU inputs (XLR) 110 Ohms
1x USB 2.0 type B

OUTPUTS

Analog Outputs: 10 balanced XLR male:
Left, Centre, Right, Left Surround, Right Surround, Left Back, Right Back, Left Auxiliary, Right Auxiliary and Subwoofer
16 single ended (unbalanced) RCA:
Left, Centre, Right, Left Surround, Right Surround, Left Back, Right Back, Left Auxiliary, Right Auxiliary & Subwoofer, 4 tape outputs, 2 Zone Two outputs.

Digital Outputs: 2x HDMI
1x TOSLINK optical

Trigger Inputs/Outputs:

One 12V input and 3 programmable trigger outputs

DATA & CONTROL PORTS:

1x Infra-Red sensor; remote control receiver
1x mini (3mm) phone jack (2 conductor) for auxiliary infra-red control data input
1x Ethernet (RJ45 connector): bilateral data, software download, etc.

INFRA-RED REMOTE CONTROL

Number of buttons: 30
Power Source: two AAA batteries
IR Wavelength: 940nm

PHYSICAL SPECIFICATIONS

Dimensions: 17"W x 14.25"D (not including knobs & connectors) x 5.75"H (not including rubber feet)
17"W x 15.38"D (including knobs & connectors) x 6.25"H (including rubber feet)
Also available with 19"W dress panels (all other dimensions are the same)
Weight: approx 22 lbs (10 kg)
Chassis Temp: 50 deg Celsius max.

Specifications subject to change without notice.

TRADEMARK ACKNOWLEDGEMENTS



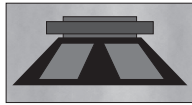
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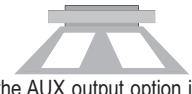
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5.1 SURROUND SPEAKER PLACEMENT GUIDE

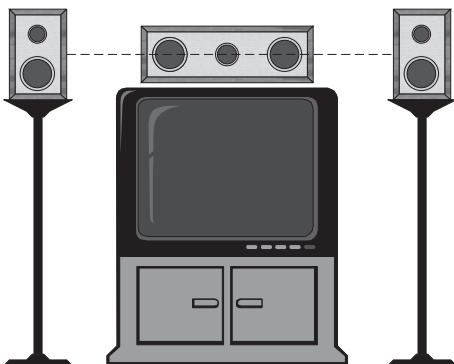
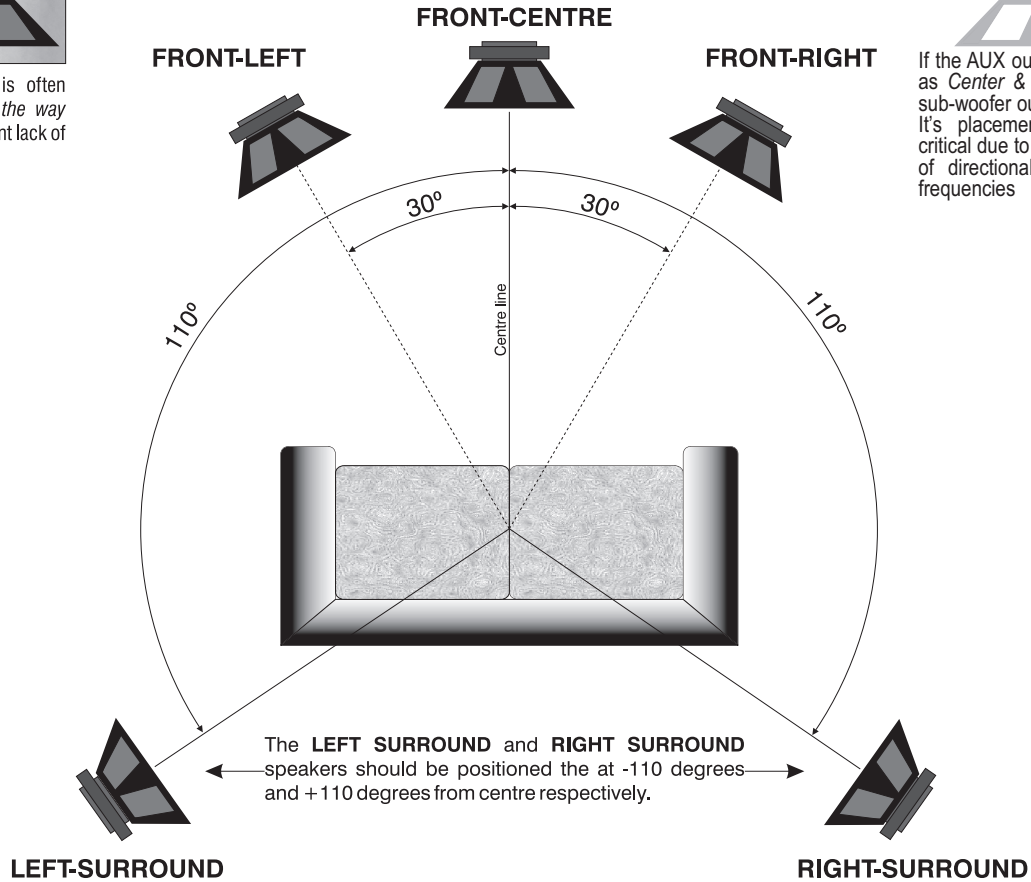
If the AUX output option is set as *Center & Sub* then a 2nd *Center* output is available allowing for two *Center* channel speakers to be used. Placement will be critical due to the largely voice band signals in this channel.



A **sub-woofer** is often located *out of the way* due to its inherent lack of directionality



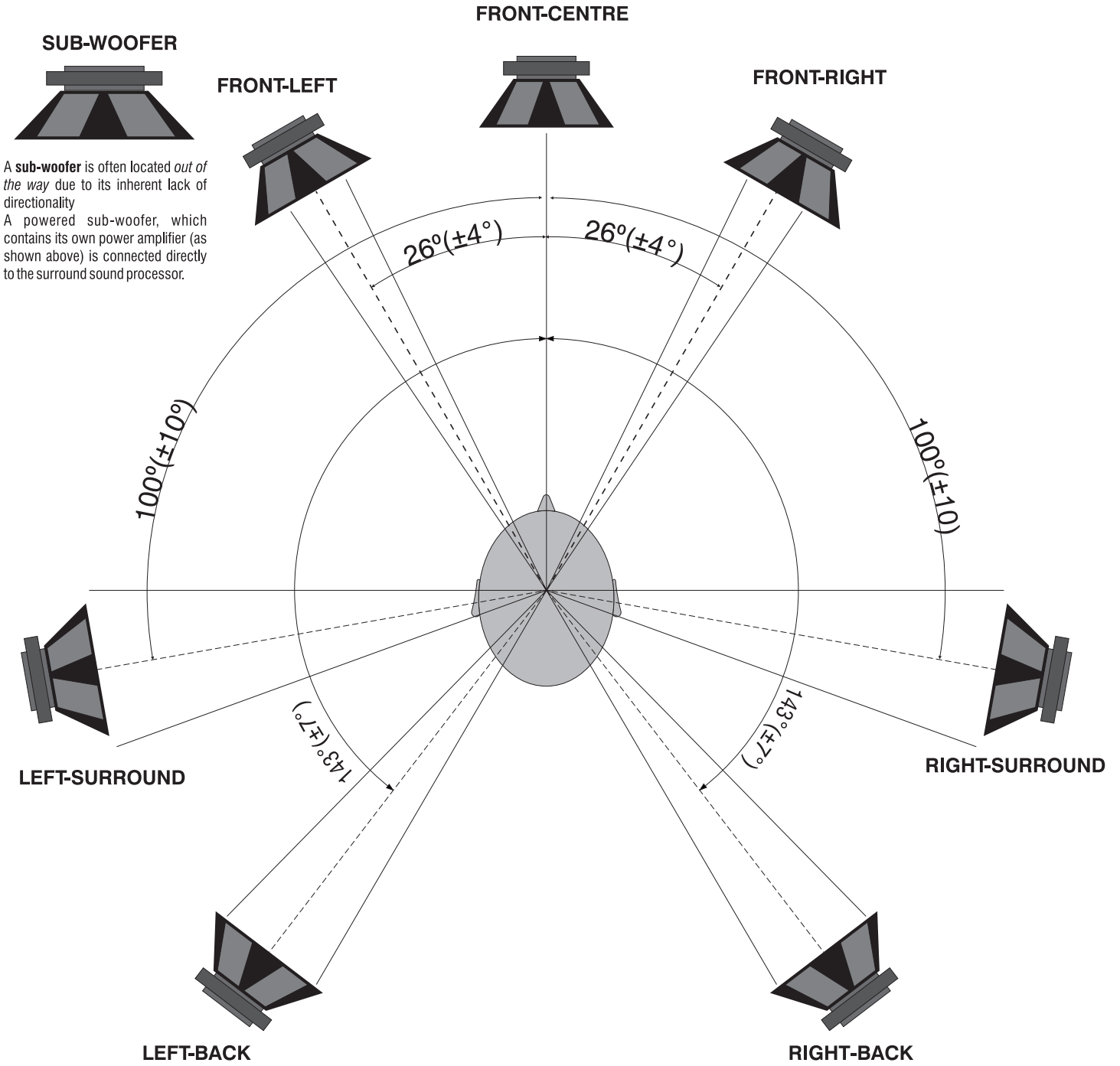
If the AUX output option is set as *Center & Sub* then a 2nd sub-woofer output is available. It's placement may not be critical due to the inherent lack of directionality of very low frequencies



VERTICAL PLACEMENT OF SPEAKERS

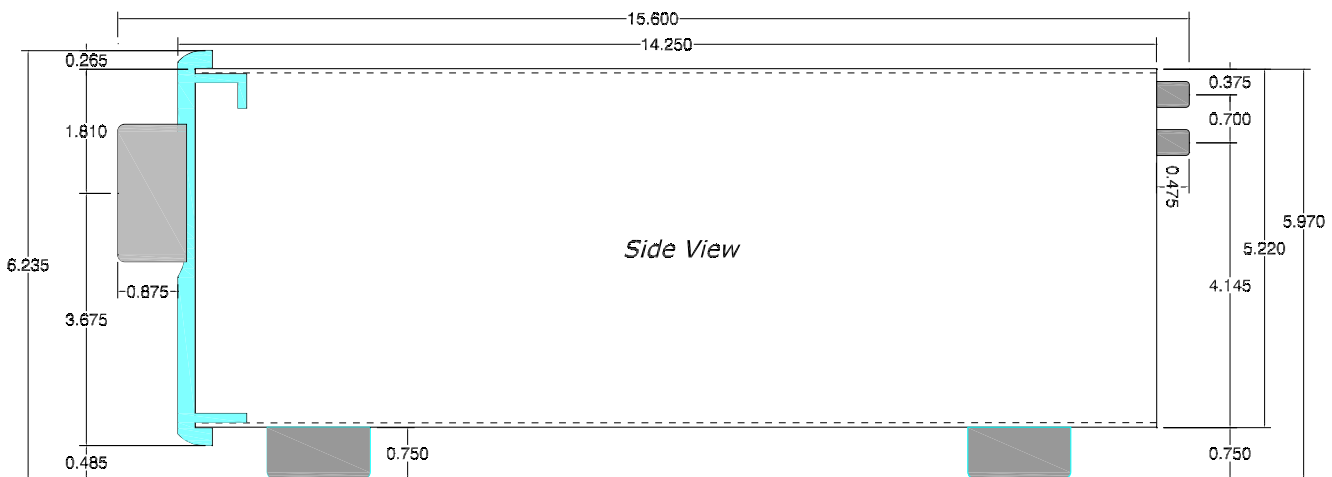
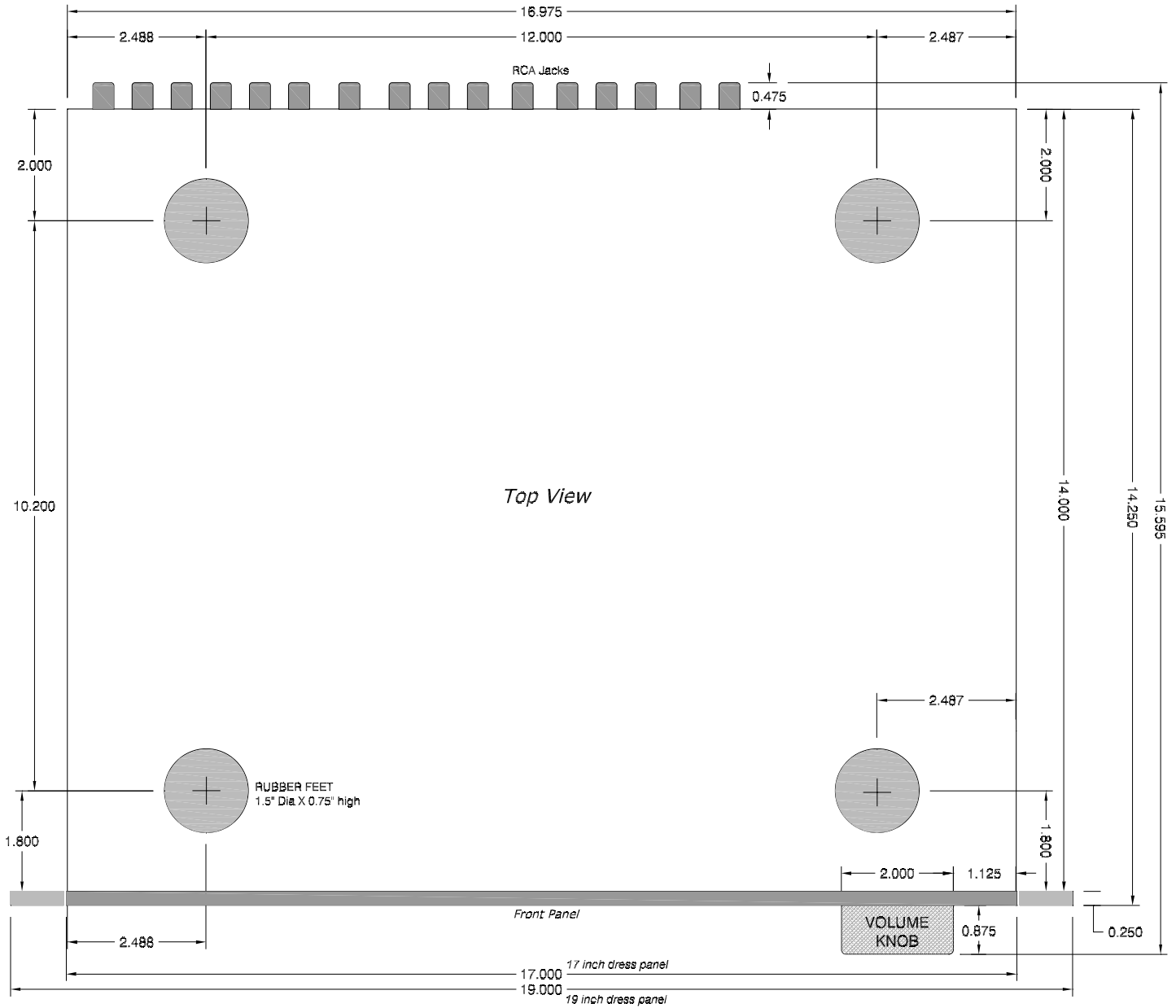
The front speakers are normally placed at ear level, but where the front-centre speaker is placed on top of the television or video monitor the front-left and front-right speakers should be elevated to be in-line with the centre speaker

7.1 SURROUND SPEAKER PLACEMENT GUIDE



A **sub-woofer** is often located *out of the way* due to its inherent lack of directionality
 A powered sub-woofer, which contains its own power amplifier (as shown above) is connected directly to the surround sound processor.

SP3 EXTERIOR DIMENSIONS



APPENDIX A

SP3 SURROUND SOUND MODES

SP3 SURROUND MODES

Pressing the SURROUND left (◀) and right (▶) arrow buttons will allow you to sequentially select one of the many available decoding modes for expand almost any 2 channel music source signals. The custom SP3 Surround Modes use a set of DSP algorithms to create a set of simulated surround sound signals from the original left and right 2 channel data.

CLUB: This Sound Field Mode is intended to simulate being fairly close, around 10 feet away, in a small intimate club setting with a moderate amount of reverberation that does not destroy clarity. The result is a bit colored for speech due to the small room size, but it is quite suitable for jazz groups, cabaret, small-venue rock 'n roll, and a small disco venue where dance music is played. This mode can also be used for classical chamber music and solo instrumental music of most kinds.

NATURAL: PLII Natural mode enhances the basic stereo reproduction by using the inherent acoustics recorded within the source material. If the source material was surround encoded or recorded in an acoustically oriented manner (such as a lot of classical music and many live recordings) this mode can provide truly spectacular effects and an enhanced sense of the space in which the music was being performed.

PARTY: The Party (Seven-Channel Mono) Mode converts stereo input to a mono signal which is then distributed to the 7 satellite channels plus sub-woofer.

STEREO7: The Stereo7 (Seven-Channel Stereo) Mode converts stereo input to surround sound. The stereo signal is distributed to the 7 satellite channels plus sub-woofer, creating a giant stereo image in your listening space.

PRO LOGIC: Dolby Surround/Pro Logic is based on basic matrix technology. When a Dolby Surround soundtrack is created, four channels of sound are matrix-encoded into an ordinary stereo (two channel) sound track. The centre channel is encoded by placing it equally in the left and right channels; the rear channel is encoded using phase shift techniques. A Pro Logic decoder/processor "unfolds" the sound into

the original 4.0 surround—left and right, centre, and a single limited frequency-range mono rear channel using 'Steering Logic', which drives amplifiers, to raise or lower the output volume of each channel based on the current dominant sound direction. In addition the surround channel is slightly delayed, so that any front channel sounds that leak into the surround channel arrive at the listener after the front channels, providing an illusion of greater separation.

PLII MUSIC: This mode can enhance normal stereo music recordings, offering a wider soundstage and enhanced spatial effects. This offers user control over:

PLII MOVIE: This is the preferred decoding method for watching movies with matrix surround encoding. The centre width and dimension variables are set and optimized for this application, and cannot be adjusted. No filters are present on the surround channels, and auto-balance is operational.

NEO:6 MUSIC: Neo:6 derives a centre channel from two-channel material. Neo:6 music mode to expands stereo non-matrix recordings into the five- or six-channel layout, in a way which does not diminish the subtlety and integrity of the original stereo recording. In music mode, the intent in the front channels is less one of steering and more one of stabilizing the front image by augmenting it with a centre channel, while preserving the original perspective of the stereo mix. Therefore the derived centre is never fully subtracted from the left and right channels.

NEO:6 CINEMA: In cinema mode, for Left/Right film soundtracks, sounds steered to the centre are subtracted from the left and right channels. Neo 6 provides up to six full-band channels of matrix decoding from stereo matrix material. Users with 6.1 and 5.1 systems will derive six and five separate channels respectively, corresponding to the standard home-theater speaker layouts. (The ".1" subwoofer channel is generated by bass management in the preamp or receiver.)

(Please note that the apparent effect of the Surround Modes can be adjusted by altering the delay parameters and channel volume of the centre, surrounds and back channel(s), using the appropriate menus).

APPENDIX B

RS232 SERIAL CODES

SP3 BRYSTON SERIAL PROTOCOL

HELP FILE

Rel. 5, 21-Dec-2011

SP3 receives commands and send responses to each command. It can optionally broadcast automatic responses to certain system events such as source switching by the front panel etc. (see AUFB). The format of the automatic responses is the same as the response to a serial command sent with the parameter bytes P1 P2 = "QS".

Command format are all ASCII strings with the carriage return ending:

D1 D2 C1 C2 C3 C4 P1 P2 ... <CR>

- # - command start character
- D1 - device category, 1 digit 1..f(SP3=1)
- D2 - RS485 device ID, 1 digit 0..f(dflt=0) (D2 can only be changed through the front panel menu!)
Currently D1 D2 must be "10".(*)
- C1..C4 - command name (4 chars)
- P1,P2,.. - parameters n>=2 chars (variable)
- <CR> - end character (code 13 or '\r' in C/C++)

Example:

#10MPWR01<CR>

NOTE: ANY CHARACTERS PRECEEDING # AND FOLLOWING

THE <CR> WILL BE IGNORED BY SP3. DO NOT INSERT #, SPACES, <LF>, <TAB> OR OTHER NON-PRINTABLE CHARACTERS INSIDE THE COMMAND.

Response format is the same as commands, repeating the D,C and P bytes (P bytes may carry the actual status or ?? as error marker)

Example:

#10MSRC00<CR>

NOTE: DO NOT ASSUME THAT THE NUMBER OF RESPONSE

BYTES R1,R2.. IS ALWAYS FIXED. ALLOW UP TO 320 CHARS AND READ ALL UNTIL <CR> AT THE END.

NAME | PAR | DESCRIPTION | RESPONSE

NAME	PAR	DESCRIPTION	RESPONSE
MPWR	Set Main Power	MPWRxx	
	00	Off (Standby)	
	01	On	
	QS	Query Status	

MSRC	Set Main Source	MSRCxx	
	00	DVD	

01	SAT	
02	TUNER	
03	CD	
04	DVR	
05	TAPE	
06	BAL1	
07	BAL2	
08	USB	
09	7.1 Bypass	
QS	Query Status	

MVOL	Set Main Volume	MVOLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0200..1120 in 0.1dB units plus 1000 (-80.0..12.0dB, resolution 0.5dB)	
QS	Query Status	

MMUT	Set Main Mute	MMUTxx
00	Mute Off	
01	Mute On	
02	Mute toggle	
QS	Query Status	

ZSRC	Set Zone Source	ZSRCxx
00	DVD	
01	SAT	
02	TUNER	
03	CD	
04	DVR	
05	TAPE	
08	Digital Downmix	
QS	Query Status	

ZVOL	Set Zone Volume	ZVOLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0200..1120 (-80.0..12.0dB)	
QS	Query Status	

ZMUT	Set Zone Mute	ZMUTxx
00	Mute Off	
01	Mute On	
02	Mute toggle	
QS	Query Status	

MENU	Menu	MENUxx
LE	Left	
RI	Right	
UP	Up	
DN	Down	
SL	Select	
EX	Exit one menu out,	

Main
 QS Query status
 00 = in the top (idle) screen

01..99 = inside a sub-menu
 (see enum MenuState_t)

TRIG	Trigger Output	TRIGxxx
xxx	TR1/TR2/TR3	
000	All triggers Off	
0	Trigger Off	
1	Trigger On	
*	Trigger No Change	
QS	Query Status	

LFVL	Left Front Vol Trim	LFVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

RFVL	Right Front Vol Trim	RFVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

CNVL	Centre Vol Trim	CNVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

SBVL	Subwoofer Vol Trim	SBVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

LSVL	Left Surr Vol Trim	LSVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

RSVL	Right Surr Vol Trim	RSVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

LBVL	Left Back Vol Trim	LBVLxxxx
UP	Up 1 step (0.5dB)	
DN	Down 1 step (0.5dB)	
xxxx	= 0880..1120 (-12.0..12.0dB)	
QS	Query Status	

APPENDIX B: RS232 SERIAL CODES continued

RBVL Right Back Vol Trim RBVLxxxx
 UP Up 1 step (0.5dB)
 DN Down 1 step (0.5dB)
 xxxx = 0880..1120
 (-12.0..12.0dB)
 QS Query Status

SPFR Front Speakers Setup SPFRxx
 00 Off (Not allowed)
 01 Small
 02 Large
 QS Query Status

SPCN Centre Speaker Setup SPCNxx
 00 Off
 01 Small
 02 Large
 QS Query Status

SPSB Subwoofer Setup SPSBxx
 00 Off
 01 On (not in bypass)
 02 On (also in bypass)
 QS Query Status

SPSR Surr Speakers Setup SPSRxx
 00 Off
 01 Small
 02 Large
 QS Query Status

SPBK Back Speakers Setup SPBKxx
 00 Off
 01 1 Small
 02 2 Small
 03 1 Large
 04 2 Large
 QS Query Status

SPCF Speaker Config SPCFxx
 (Fr/C/Sur/Back/Sub)
 00 no change or unknown (only QS)
 01 S/S/S/S2/Y
 02 L/S/S/S2/N
 03 L/L/L/L2/N
 04 L/N/N/N/N
 05 L/L/L/L2/Y
 06 L/L/S/S2/Y
 QS Query Status

XBAS Extra Bass Setup XBASxxxx
 (sub must be on and
 front=large only)
 00 Off or not applicable
 0000 same as above
 xxxx = 0800..1000
 (-20.0 .. 0.0dB)
 QS Query Status

MDSL Mode Select MDSLxx

00 not applicable or ignore
 AN Analog
 DI Digital
 HD HDMI
 BP Bypass 2-Channel
 QS Query Status

DISP Display brightness DISPxx
 DISPxxx...x

ON On
 OF Off
 01 25% Brightness
 02 50% Brightness
 03 75% Brightness
 04 100% Brightness
 L1 Returns Line 1
 L2 Returns Line 2
 L3 Returns Line 3
 L4 Returns Line 4
 QS Query Status

LMOD Set Listening Mode LMODxx
 -- MultiCh 2-->7.1 --

00 No Effect
 01 Pro Logic (emulates
 the old standard!)
 02 PLII Music
 03 PLII Movie
 04 Neo:6 Music
 05 Neo:6 Cinema
 06 Stereo7 (MST 7.1 spk)
 07 Party (MST mono 7.1 spk)
 08 Room Reverb: Hall
 09 Room Reverb: Church
 10 Room Reverb: Stadium
 11 Room Reverb: Club
 12 Room Reverb: Theatre
 13 Natural
 14 Stereo7x (MTX 7.1 spk)
 -- MultiCh 5.1-->7.1 --
 21 Dolby D 5.1 (no back)
 22 Dolby D ex 6.1 Movie
 23 PLIIx ex 6.1 Music
 24 PLIIx ex 7.1 Movie
 25 PLIIx ex 7.1 Music
 26 PLIIx ex AUTO
 -- 1 or 2 CH --
 ST STEREO (2.1 speakers)
 MN MONO (2.1 speakers)
 QS Query Status

DVOL Dynamic Range(DRC) DVOLxx
 and Dolby Volume(DV)

00 ALL OFF
 01 DRC OFF; DV LOW - FULL
 02 DRC OFF; DV MED - FULL
 03 DRC OFF; DV HI - FULL
 04 DRC OFF; DV LOW - HALF
 05 DRC OFF; DV MED - HALF
 06 DRC OFF; DV HI - HALF

07 DRC MED1;DV OFF
 08 DRC LOW2;DV OFF
 09 DRC AUTO;DV OFF
 QS Query Status

DDVL Dolby Volume Adj DDVLxxxxxx
 xxxx = 0200..1120

(-80.0..12.0dB)
 Set DV Calib. Offset
 (default=0,high=
 less loud!)
 MS0 Mid/Side OFF (default)
 MS1 Mid/Side ON (useful
 in stereo)
 QS Query Status
 (resp example DDVL0000MS1)

TEST Pink noise setup TESTxx

ALL Automatically sequence
 all channels every 4s,
 then exit.

MAN Start manual sequence
 or increment channel if
 already started

LF Start Left front (01)
 CN Start Centre (02)
 RF Start Right front (03)
 RS Start Right surround(04)
 RB Start Right back (05)
 LB Start Left back (06)
 LS Start Left surround (07)
 SB Start Subwoofer (08)
 EX Stop and Exit pink
 noise setup
 QS query status. Resp
 00 = not playing
 01 = L (front left speaker)
 02 = C
 03 = R
 04 = RS
 05 = RB
 06 = LB
 07 = LS
 08 = SUB

INPT Query Input Signal INPTxx
 (Source Program)

QS query, response xx=
 00: Unknown or illegal
 01: Analog, BP7 or BP2
 02: Digital pass-through
 03: Pink-noise test
 04: Auto
 05: Bitstream
 06: All DTS formats
 07: PCM Auto
 08: PCM (CD audio)
 09: PCM 8 ch
 0a: AC3 (Dolby Dig)
 0b: DTS

APPENDIX B: RS232 SERIAL CODES continued

0c: AAC (MPEG4,MPEG2,iPhone,
iPod,iPad,NintendoDSi,
iTunes,DivX,PS3,PSP,
SonyWalk,phones,Wii.
0d: MPEG (MPEG1 Layer 1 and 2)
0e: DTS12 (DVD IEC Type 12)
0f: DTS13 (DVD IEC Type 13)
10: DTS14 (CD 14-bit)
11: DTS16 (CD 16-bit)
12: WMP (WMA Pro)
13: MP3
14: DSD1 (SACD 1bit)
15: DSD2
16: DSD3
17: DDP (Dolby Dig +)
18: DTS HD or Master
19: DOLby TrueHD
1a: DXP (DTS Express)

AFMT Query Input Format PFMTxxxxxxx
(Program Format)
QS Query, returns program format
as 8 digit hex value, bit-flags:
BIT0 - Left
BIT1 - Right
BIT2 - Center
BIT8 - single surround
BIT9 - dual surround
BIT10 - single back
BIT11 - dual back
BIT12 - Low Freq Effects
BIT13 - Dual Subwoofer (not supp)
BIT16 - Not Stereo Surround-Encoded
BIT17 - Yes Stereo Surround-Encoded
BIT18 - Not Back Surround-Encoded
BIT19 - Yes Back Surround-Encoded
BIT20 - Mono
BIT21 - Dual Mono
BIT24 - Karaoke (not supp)

RATE Query Input Sample RATExxxxxx
Rate of the bit stream
(Frame Rate)
QS Query, returns sample rate
in Hz (000000=unknown).

VFMT Query Video Input VFMTxx
Format
QS Query, returns video timing and
format code xx in hex.
*** See helpvfmt.txt document. ***

VCOL Video color depth VCOLxx
QS query, response xx=
00: AUTO
08: 3x8 bit
0a: 3x10 bit
0c: 3x12 bit
10: 3x16 bit
fe: not applicable

ff: unknown

VCP Copy protection VCPxx
status
QS query, response xx=
00: none
01: HDCP
02: Macrovision
80: AUTO
81: ON
ff: unknown

OUTP Query Output Format OUTPxxxxxx
(Listening Format)
QS query, returns listening
format as 3 chars:
n.w
or as 7 char string:
f/s/b.w

INFO Query system info INFOxxx...xx
QS Query, returns system
data in as a long
string (typ <300 chars)
broken into 22
<LF>-delimited lines
(code 10 or '\n'),
as follows:

#10INFO<LF>
01:%8s<LF> {PRODUCT NAME}
02:%8d<LF> {SERNUM}
03:%8d<LF> {MANUFDATE}
04:%12s<LF> {SOFTWARE REV}
05:%8s<LF> {BOOTLOADER REV}
06:%8x<LF> {DSPA ID}
07:%8x<LF> {DSPA VER}
08:%8x<LF> {DSPB ID}
09:%8x<LF> {DSPB VER}
10:%8x<LF> {CPU PIC32 REV}
11:%8x<LF> {HDMI VER REL}
12:%8x<LF> {KEYPROC PIC16}
13:%8x<LF> {ETHERNET}
14:%8x<LF> {FLASH}
15:%8x<LF> {EEPROM}
16:%8x<LF> {VOLUMECHIP}
17:%8x<LF> {USBAUDIO}
18:%8x<LF> {ZDAC}
19:%18s<LF> {MACADDR[18]}
20:%16s<LF> {NETBIOSNAME[16]}
21:%4d<LF> {MAINBOARD REV}
<CR>
Note: %8x means 8 character hex,
%8d means 8 character decimal,
%12s - 12 chars long string, etc.

ASAV Set auto-save ASAVxx
or force save now
00 OFF any parameter changed
will not be automatically

saved in EEPROM.
(will require ASAVSV
command to save!)
01 ON Automatically saves all
changed parameters (within
2s). Will also force
saving of currently
modified parameters.
SV force save all modified
parameters, without
changing the auto save
status (ON or OFF)
QS query, return auto-save
status

AUFB Set auto-feedback AUFBxx
00 OFF automatic response
on device status change
or button press actions
will not be broadcast
(only the responses to
explicit commands)
01 ON automatic response
will always be sent.
QS query, return the AUFB
status.

____ xx... null command, always ____ xx...
ignored, use for
comments (xx.. is
arbitrary ASCII string,
can be empty)

-- END OF FILE --

SP3 - RS232 port

(09-Jan-2012, Stan B., Bryston Ltd.)

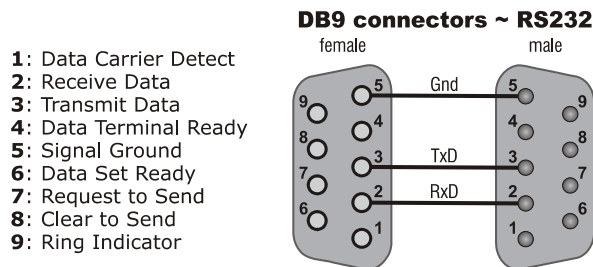
How to enable RS232 port

RS232 parameters can be set in the hidden screen.¹ under Miscellaneous. The communication format is fixed: 8 bit data, 1 start bit, 1 stop bit, no parity, no handshake.

There are two configurable parameters:

- 1) RS232 MODE: OFF/ON/ON+AUTOFB
 - OFF - RS232 port is disabled
 - ON - RS232 port is ON without auto-feedback²
 - ON+AUTOFB - RS232 port is ON with auto-feedback³
- 2) RS232 BAUD: 9600/19200/38400
 - baudrate selection (default is 9600)

Connector diagram



Testing of SP3 communication.

The following free RS232 terminal utilities can be used for testing the SP3 communication:

Termite 2.7 (tested OK, easy and straightforward to use):

http://www.compuphase.com/software_termite.htm

Hercules 3.2.4 (tested OK, type commands as ##10MSRC03<CR>, no local echo, can use TCP/IP)

http://www.hw-group.com/products/hercules/index_en.html

Other free (untested):

http://download.cnet.com/Ckubed-Advanced-Terminal-Program/3640-2085_4-10234733.html

(note: I used and tested an old version 2 of CKubed on WinXP, however seem to be problems with uninstalling of the current version 4.4)

<http://realterm.sourceforge.net/index.html#downloads> Download

Sources for MS VB.net and C#:

http://www.lvr.com/files/com_port_terminal_vb.zip

http://www.lvr.com/files/com_port_terminal_cs.zip

¹ To unlock the hidden screens: go to Miscellaneous, scroll down to the bottom screen (3-rd from the top). Press ZONE, DVD and TAPE buttons, one at a time, in this order. A down arrow will appear in the bottom right corner of the screen. Scroll down until you see the required parameter.

² RS232 commands sent will still be echoed back using standard reply format described in the helpcmd.txt

³ Auto feedback is the response similar to an RS232 command response described in helpcmd.txt but issued by the SP3 to Host following a system status change, initiated by non-RS232 action. For example, when DVD front panel button is pressed SP3 would send #10MSRC00<CR> back to host.

APPENDIX D

HDMI HANDSHAKING

SP3_Notes_HDMI-2_20120111

(11-Jan-2012, Stan B., Bryston Ltd.)

HDMI Handshaking

When SP3 selects HDMI input port as its audio signal source, it acts as an HDMI repeater, placed in between HDMI signal source (DVD player, BD player etc) and HDMI signal “sink” (TV screen, TV projector etc). Every class of the devices on the HDMI chain has to respond to the HDMI handshake procedure, initiated by the signal source, that is by a player. The handshake is initiated normally on power up, on disk reinsertions, or on other events. In order to make the initial handshake proceed optimally, the HDMI devices should preferably be powered up beginning with the “sink” (TV screen), then the repeater (SP3) then the player. That way the main signal source will be immediately able to poll (handshake) the rest of the HDMI chain which will already be powered up and ready to respond.

Using more than 1 HDMI source (player)

If 2 HDMI sources are connected to SP3 HDMI inputs, then SP3 will select only one link at a time, leaving the other link “dead ended”. This may break the established handshake status between the player that is not currently active, and the TV screen resulting in a possible change of the player output signal format. This behaviour is strongly player-dependent and copy-protection dependent on the media being played. Some DVD or BD players maintain the last signal sample rate and format that was played previously to an interruption (or disconnect)¹, some other players tend to immediately downgrade the output stream from multi-channel audio to stereo or from encoded streams such as DTS or Dolby Digital to PCM. Some players may also downgrade the sample rate of audio and downgrade the video resolution.

This may cause various artefacts or somewhat unpredictable behaviour (loss of audio etc) when switching away from one HDMI source to another source and then back. If the drive switched the format while being disconnected and would not restore the previous one, then pressing HDMI button again to switch it off to analog² and then on again may force the drive to re-handshake and restore the original.

If that does not restore the correct HDMI status then reinserting the disk or re-powering the player may be necessary.

HDMI multi-channel or two-channel

The signal source determines the channel format. If the number of channel is not as expected, for example 2 instead of 5.1 or 7.1 then the player may have to re-handshake the communication channel through HDMI in order to recover the proper status. Certain media revert to a 2 channel audio format during menus and then switch to multi-channel when playing a selected contents. Some media contents may be originally recorded as 2 audio channels, in this case one can use the surround synthesis³ feature in SP3 to produce 7.1

¹ As long as the disk is in.

² HDMI button toggles between HDMI active and Analog mode, while the actual HDMI chain link from the source to the TV screen remains unbroken. As long as the main source selection remains unchanged. This feature allows passing the video signal through HDMI while using analog for audio. At the same time since the HDMI chain remains unbroken while toggling the HDMI active on/off, it allows the player to re-handshake with the TV screen re-establishing the original channel format.

³ This is often referred to under the term “re-creation” mode that is creating the extra audio channels out of the stereo feed. Use surround left and right arrow keys to select among several surround modes. Those selections are not applicable when the original content is 7.1, and only a limited selection is applicable with the original 5.1 stream when 7.1 has to be synthesized out of the 5.1.

APPENDIX D: HDMI HANDSHAKING continued

A player will try to output the highest resolution (video) and the highest number of audio channels, and the highest sample rate⁴ that is available in the media being played, and which is still supported by both the repeater (SP3) and by the “sink” (TV) further down the HDMI device chain. This is determined by the maximum capability of the SP3 (Video up to 1080p, 3D, color depth 36, audio 7.1 channels up to 192kHz sample rate). In some cases very long HDMI cables (i.e 10m) the limiting connection factor becomes the cable itself. In such cases the source device will often negotiate a lower video or audio resolution format than would have been available over a shorter cable⁵.

PCM versus “bit-stream”

Most DVD and Blue-ray players can be configured to output audio contents either as PCM (or “Linear PCM”) or as “bit-stream”. The former option makes the player decode and convert the media format to an uncompressed PCM format which is the most compatible. The latter option causes the player to transmit the digital contents of the media “as-is” unconverted, down stream to the repeater (SP3) and the sink (TV). The “bit-stream” option relies on the audio decoding being performed in the SP3, and ensures the highest quality⁶. SP3 is capable of decoding virtually all common digital audio format including the latest lossless formats such as DTS-Master and Dolby TrueHD, thus it is recommended to use “bit-stream” player setting.

References:

<http://en.wikipedia.org/wiki/HDMI>

<http://www.hdmi.org/learningcenter/kb.aspx>

⁴ Sample rate or “frame” rate (in this case “frame” and “sample” are synonyms) is the frequency of the digital data frames. For example 44.1kHz is the repetition frequency of the whole data frames transmitted from a standard Compact Disk (CD). One data frame is 16 to 24bits of digital data. Typical sample or frame rates are 44.1kHz (CD), 48kHz (DVD), 88.2kHz (SACD), 96kHz (high end digital sources), 176.4kHz, 192kHz – future very high resolution audio sources. Frame rate shouldn’t be confused with the bit clock rate which is the clock frequency of the bits within each data frame. For example, for CD disk the bit clock is 2.822MHz.

⁵ This is a part of the HDMI adaptive filter configuration feature. The sink measures the electrical quality of the cable during handshake and can block transmission that is exceeding a capacity of the cable, forcing the source to downgrade the stream to a lower resolution settings.

⁶ In the practical situation the difference in audio quality between down-converted PCM and the “bit-stream” may be difficult to perceive.

APPENDIX E

USB GUIDE

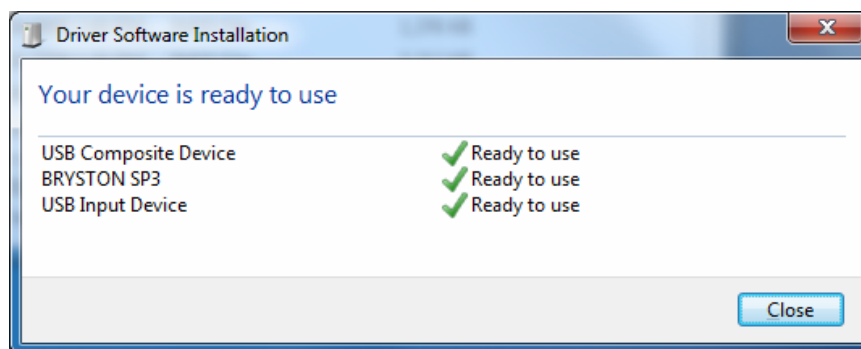
SP3 – User’s Instructions for USB

(11-Jan-2012, Stan B., Bryston Ltd.)

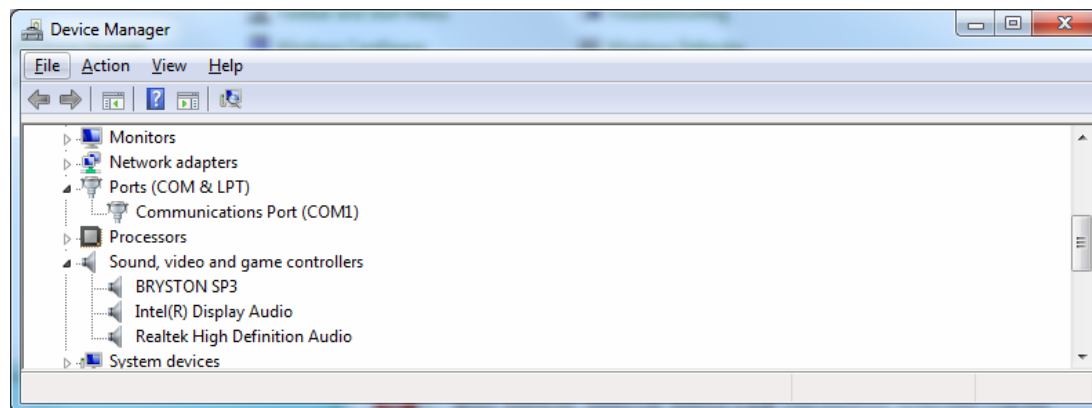
USB port (Revision 1.1) in the SP3 emulates the streaming receiver device. It allows receiving a digital sound stream from a host device such as a PC, originating from a file or internet, and playing it through SP3 audio processor.

Initiating a USB connection with a PC (Windows 7).

Make sure SP3 is connected to a power source but in Standby. When the USB cable connecting SP3 is plugged to a USB port in a PC and SP3 is taken out of Standby, a message Driver Software Installation is produced in the system tray area. Clicking on it opens up the following message window:



Message screen on USB connection event.



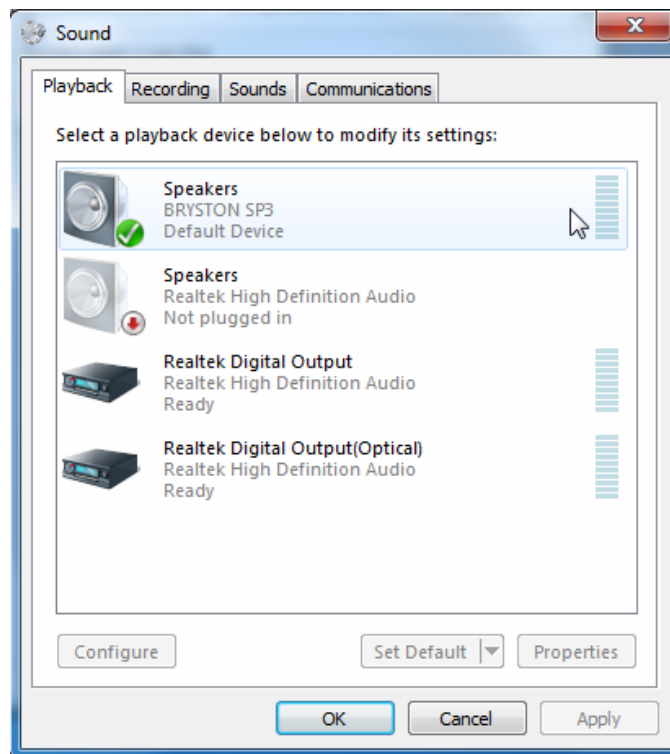
Device Manager window (Control Panel).

See BRYSTON SP3 item under “Sound, video and game controllers” section. If this is not present as illustrated above, then the SP3 USB port is not connected or not recognized by the operating system.

Selecting “BRYSTON SP3” as the default Audio Device.



Sound Manager window (from the System Tray)



Click on the “Speakers/BRYSTON SP3” line to make this the default.

When BRYSTON SP3 has been selected as the default speaker, then any media player device will be outputting digital audio stream through the USB port to SP3.

To test the operation, press USB button on the SP3 front panel and start Windows Media Player, then select and click one of the sample music files.

APPENDIX F

WEB INTERFACE GUIDE

SP3 Web Interface Guide (Draft doc 7-Feb-2012, Bryston Ltd., Stan Bleszynski)

1. General guidelines (introduction).

SP3 can be connected to a PC (Windows, MacOS, Linux etc) using Ethernet cable through a local area network hub or through a direct peer-to-peer (SP3-to-PC) using a cross-over network cable¹.

Connection between SP3 and a PC can be established using either one of the 3 basic configuration schemes differing in the way the IP addresses are leased out or assigned. This is described in more details in the following document on-line:

ftp://ftp.bryston.com/pub/fw/sp3/doc/SP3_setup_using_LAN2.doc

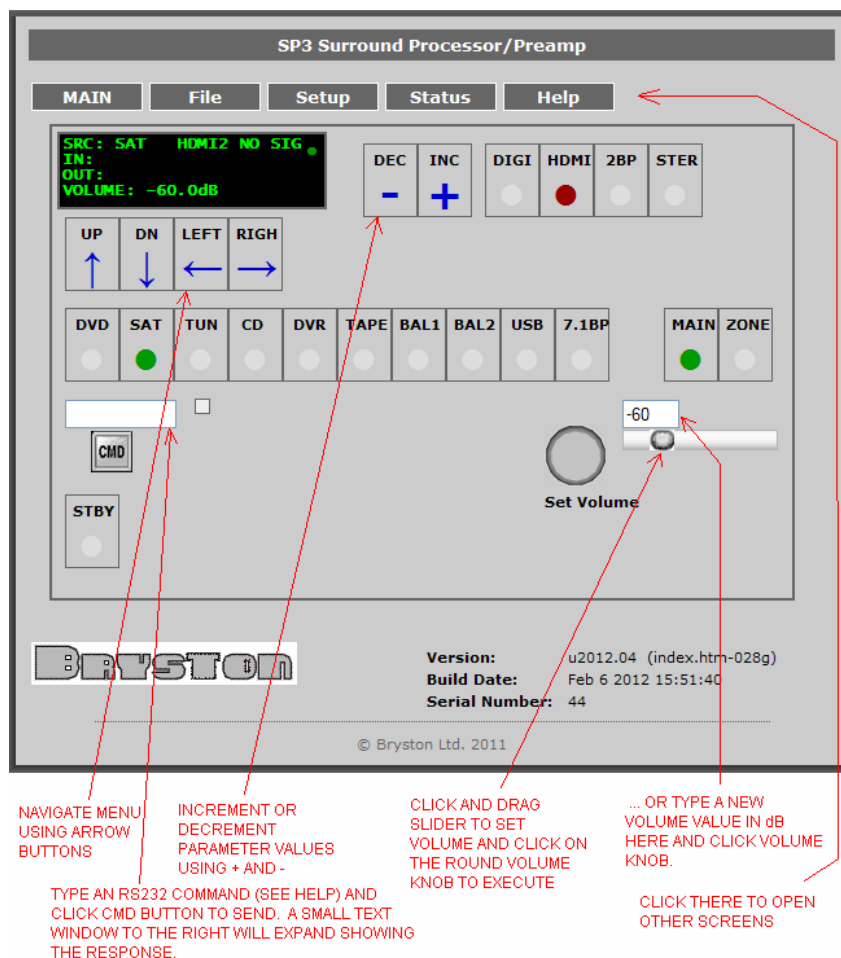
or

ftp://bryston.com/pub/fw/sp3/doc/SP3_setup_using_LAN2.doc

2. Main screen.

Communication interface with the SP3 is handled by an internet browser, for example Internet Explores, Chrome, Safari, etc. Once a connection is established, typing in the SP3 so-called “Net Bios Name” or its IP address in the browser URL window and pressing enter, should bring the following screen:

Main SP3 Web Interface Screen



¹ An Ethernet cable where the Rx and Tx lines are swapped at one end of the cable. For computer-to-computer hookup (as opposed to computer-to-hub hookup). See reference links above or in Appendix H

2. File upload screen.

Click on the top “File” menu link on the main SP3 web interface screen brings the “Firmware Upload” screen.

All SP3 screens except Main and Help require a password. The first time File is clicked on the Main screen, an intermediate password entry screen will show up:



Firmware Upload screen

Insert the user name admin and password Bryston as shown above and click OK button. Once this is done, it is valid for as long as the browser is not exited and the user will not have to re-enter it again.



Firmware Upload screen

APPENDIX F: WEB INTERFACE GUIDE continued

Clicking on the “Upload Image File (.bin) opens up a file selection subscreen which allows selecting a compressed firmware file (of type .bin) and then starting upload and programming. This is described in more details in the following on-line document:

<ftp://bryston.com/pub/fw/sp3/doc/UploadInstruct.doc>

Note: selecting of “Restricted Default Flash Partition” allows overwriting of backup files in the SP3 flash. This option is normally not enabled.

3. Setup screen.

SP3 Surround Processor/Preamp

MAIN File Setup Status Help

Board Configuration

This page allows the configuration of the board's network settings.

CAUTION: Incorrect settings may cause the board to lose network connectivity!

Enter the new settings for the board below:

MAC Address:

Host Name:

Enable DHCP Client Enable DHCP Server


IP Address:

Gateway:

Subnet Mask:

Primary DNS:

Secondary DNS:



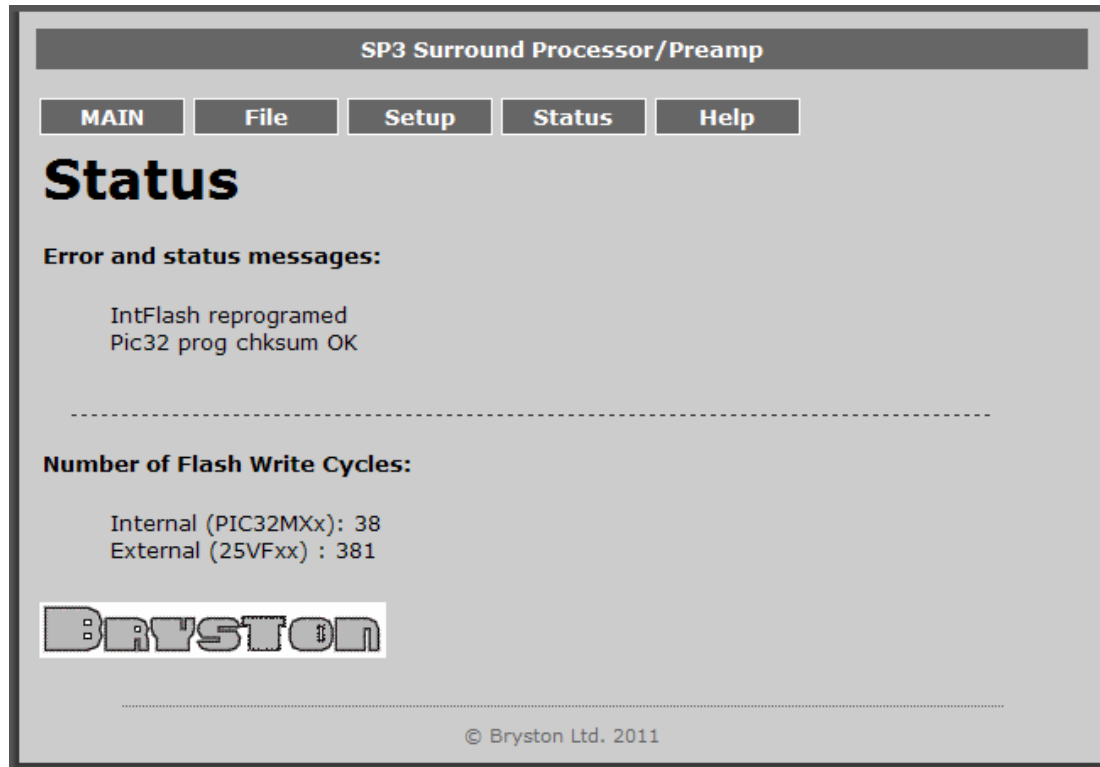
© Bryston Ltd. 2011

This screen displays network-connectivity settings and also allows modification of: DHCP mode selection, IP address, Gateway IP address, Subnet Mask, Primary DNS and Secondary DNS.

MAC Address and Host Name² are hard-coded and cannot be changed and saved!

² This is the same as “Net Bios Name” referred elsewhere in the documentation.

4. Status screen.



Setup screen (as of firmware version 2012.04)³

Status screen displays the current “Error and Status messages” (if any), and “Number of Flash Write Cycles”⁴

³ This screen will be modified in the future to display information available currently on the SP3 Vacuum Fluorescent display in menus SYSTEM SETUP→TEST→SYSTEM STATUS and HDMI STATUS

⁴ This is an advanced technical information for support engineers.

APPENDIX F: WEB INTERFACE GUIDE continued

5. Help screen.

SP3 Surround Processor/Preamp

[MAIN](#)
[File](#)
[Setup](#)
[Status](#)
[Help](#)

Help

INSTRUCTIONS FOR BRYSTON SP3 SURROUND PROCESSOR/PREAMP

[User Manual](#)
[Remote Communication Commands](#)
[Infrared Remote Controller Codes](#)

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 Phone: 705 742-5325
 Fax: 705 742-0882
<http://www.bryston.ca>

Setup Screen

Configuration screen allows changing and saving the system parameters relating to TCP/IP Stack and communication through Ethernet cable with a microcomputer running an internet browser.

MAC Address - encoded address in the format as follows: "04:6D:42:01:01:23", where the first 4 byte values are fixed and the last two byte values are specific to and unique for every device manufactured by the company.

Host Name - URL name that the device will be recognize under. For example putting here "sp3" means that the user will have to type "http://sp3-123" in the browser's URL window, in order to access this device.
 (Note: 123 is a serial number, an example)

Enable DHCP Client - check this box to allow your network server (typically a router) to automatically assign some IP address (for example 192.168.1.111) to this device. Typically, this option should be checked when this device is connected to an existing local network, corporate or home network, that already has a network server PC or a router.

Enable DHCP Server - check this box to allow this device to act as the network server to assign an IP addresses to another device (typically a PC client) connected to it. Typically, this option should be checked when a single PC is connected directly and exclusively (peer-to-peer) to this device.

Save Config - click this button to save and made permanent any changes that were made to this screen.

Help screen as of release 2012.04 (top part)

The top part of the Help screen contains 3 important links to documents:

User Manual – an on-line version of the user manual (this link requires an active Internet connection)

Remote Communication Commands – displays the list of available RS232 commands

Remote Control Codes - displays the list of available IR remote controller codes.

APPENDIX F: WEB INTERFACE GUIDE continued

These Remote Control codes can be entered in to BR3 remote controller by pressing “Code” button once (which lights the red LED) and then pressing three numeric buttons⁵ in the short succession while the red LED is lit.

(Note: the last 2 links refer to embedded files in the SP3 and thus are always available regardless of Internet connectivity.)

Help screen
(bottom part)

Reconnection Instructions

1. **Did you change the hostname?**
You should be able to access your board by clicking the link above.
2. **Did you change the MAC address?**
The DHCP server probably assigned the board a new IP address, but your computer's network cache has saved the wrong address. From the command prompt in Windows, enter "nbtstat -R" to clear old values, then try the link above.
3. **Did use the correct IP address?**
Try accessing the board directly at the IP address shown in the MISC menu screen, for example type "http://169.254.1.1/" directly into your browser URL line. If this fails, then that IP address you set may not yet be reachable. Try the step below.
4. **Still not working?**
If you are connected through a LAN router acting as a DHCP server then set up DHCP setting in the MISC menu as "CLIENT", then reset everything, that is - reboot your PC or "nbtstat -R", re-power the router and re-standby the SP3. Selecting DHCP=CLIENT&SERVER should also work in most circumstances, except it is not recommended with business/office LANs because it may in some cases cause the main network server to cease acting as the main DHCP server for other workstations.
5. **If it is still not working, then:**
If your PC is running Windows and is connected directly to SP3 through a LAN cable, then then set up MISC menu: either as:
(a) DHCP=SERVER, or
(b) IPADDR=169.254.1.1, IPMASK=255.255.0.0, DHCP=STATIC and then reset everything.
It sometimes may take a minute for a Windows system to re-negotiate a LAN connection after a change.


Firmware Upgrade

1. Go to the following remote directory by clicking on the ftp link below

["ftp://ftp.bryston.com/pub/fw/sp3/"](ftp://ftp.bryston.com/pub/fw/sp3/)

 Right-click on the SP3.bin file, download it to a local directory in your PC (for example to "Desktop")
2. Click on the File menu above in this window. If you are prompted to log-in: user name is admin, password is bryston. Select this file (SP3.bin) and click Upload button to start the process. Wait about a minute to complete, do not switch the power off while SP3 is in the process of self-programming.

Note: access to certain pages is restricted:
 User Name: admin Password: bryston
[Access Restricted Page](#)



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⁵ Numeric buttons 0-9 in the BR3 are assigned to the following buttons, in this order: MUTE=0, TEST=1, DTS=2, DOLBY=3, 2CH=4, HDMI=5, DIG=6, ←SURR=7, SURR→=8, STEREO=9.

APPENDIX G

SUB-WOOFER SETUP

SP3 Subwoofer & Speaker Setup

(Draft doc 7-Feb-2012, Bryston Ltd., Stan Bleszynski)

1. Introduction.

Subwoofer output carries a combined (sum) contents of bass extracted from all the other speaker channels, for those speakers that are declared as “Small”, and also includes the Low-Frequency Effect contents (LFE) present optionally only in the multi-channel stream (labelled as 5.1, 6.1 or 7.1).

Bass contents is defined as the portion of the audio spectrum of frequencies from all the channels that are below the cross-over frequency (default is 80Hz), added up to the LFE channel (if present). The cross-over frequency can be modified in the SOURCE SETUP→CROSSOVER F_c submenu, separately for the front speakers, center, surround and back. The LFE channel cannot be altered or cut off¹ and the cross-over frequency setup or Xtra Bass setup does not affect it.

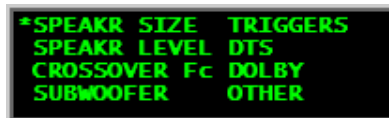
Bass contents carried through those channels where the speakers are declared as “Large” is not re-routed through the Subwoofer. Instead it is output through those speakers directly.

If Subwoofer is declared as not present, then the bass contents from all the channels will be re-routed through the large speakers only (if there are any), otherwise it will be cut-off.

SP3 provides a single subwoofer channel through back panel RCA socket paralleled with an XLR socket. Optionally, it can also output the subwoofer channel through the Aux R socket.²

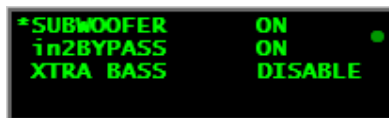
2. Speaker Configuration.

Speaker configuration involves declaring the size such as Large³, Small or None (see SPEAKR SIZE menu) for the five categories of speakers: Front (Left and Right), Center, Surround (side surround), Back (rear surround) and Subwoofer (in SUBWOOFER sub-menu).



Source Setup Screen

Volume level corrections (from -12 to +12dB) can be entered for each speaker individually in the SPEAKR LEVEL screen.⁴ Cross-over frequencies can be modified in CROSSOVER⁵ and subwoofer configuration is in SUBWOOFER submenu.



Subwoofer setup screen (Small speakers)

¹ Except if subwoofer is declared as not present!

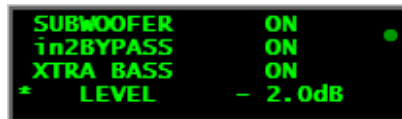
² This is not normally enabled. The default Aux selection is Aux-L= down-mixed stereo Left, Aux-R=down-mixed stereo Right (L₀,R₀). To enable subwoofer through Aux-R, change SYSTEM SETUP→MISCELLANEOUS→AUX parameter.

³ A speaker is considered “Large” if it can reproduce bass down to 30Hz or lower. Anything else should be entered as “Small”.

⁴ SPEAKR LEVEL correction values are normally entered during or after the “Pink Noise” test, which is or will be described in a separate document. In most situations only the subwoofer level correction need to be applied specifically for a given subwoofer efficiency and gain.

⁵ Cut-off frequency may need be changed only if the speakers are unusually small with higher bass cut-off than 80Hz, or if they are medium size with lower than 80Hz cutoff but significantly higher than 30Hz (30Hz would be “Large”).

Subwoofer setup screen differs between the situation when the Front speakers were declared as “Small” (above) versus when the Front were declared “Large” (below):



Subwoofer setup screen (Large speakers)

The difference deals with the Xtra Bass feature and is described in Section 4.

3. Subwoofer in 2-channel Bypass mode.

Two channel bypass mode is selected by the front panel button labelled “2 CH. BYPASS” and applies to analog stereo (left and right only) input signals. The signals are bypassing the Digital Signal Processor (DSP) and are routed only through analog preamps and analog volume control circuit. In this mode DSP can be completely disabled when the “in2BYPASS” option is OFF, or it can be used to extract the bass contents of the analog L and R input channels and output it through the Subwoofer sockets. When “in2BYPASS” option is ON then the cross-over frequency used for bass extraction is the one set up in:

SOURCE SETUP→CROSSOVER Fc→FRONT, while the Subwoofer Volume Level correction is the one set up in:

SOURCE SETUP→SPEAKR LEVEL→SUB

4. Xtra Bass feature.

If Subwoofer is present and the Front speakers are declared as Large then bass contents will be streamed through the Front speakers while only LFE will be reproduced through the Subwoofer. In this case, in order to make the subwoofer reproduce bass from the Front speakers as well, in addition to being reproduced by the Front speakers, Xtra Bass option can be enabled. Xtra Bass option has no effect and is disabled when the Front speakers are declared Small or when no subwoofer is present. Xtra Bass option has no effect on LFE reproduction.⁶

With the Front speakers Large, Xtra Bass option can be enabled by setting the following parameter to ON:

SOURCE SETUP→SUBWOOFER→XTRA BASS

In addition, the mixing volume level of the bass contents can be adjusted by this parameter:

SOURCE SETUP→SUBWOOFER→LEVEL

The adjustment range is -20dB to 0dB. The LEVEL parameter applies only to Subwoofer in Xtra Bass (on top of the normal Subwoofer Level correction from SOURCE SETUP→SPEAKR LEVEL). It is disabled and not applied if Extra Bass is not ON.

⁶ LFE will always be reproduced only through either the Subwoofer if present regardless of the size of the Front speakers, or through the Front speakers if Subwoofer is not present and the Front speakers are Large.

APPENDIX H

SETUP USING LOCAL AREA NETWORK

SP3 and PC Setup for LAN

(draft doc 16/12/2011, Stan B., Bryston)

1. General guidelines (introduction).

SP3 can be connected to a PC (Windows, MacOS, Linux etc) using Ethernet cable connected to a local area network hub or a direct peer-to-peer crossover network cable, using either one of the 3 basic configuration schemes differing in the way the IP addresses are leased out or assigned. This is called “Dynamic Host Configuration Protocol” service (DHCP), see http://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol

a) Static host IP and static SP3 IP.

This method is described in more details below in section 2. In most configuration where the LAN card of the host PC is set up for static IP address, SP3 would connect regardless of the DHCP selection, though “STATIC IPadr” is recommended. “NetBios Name” addressing cannot be used in this scheme (for example <http://sp3-123> would not work). SP3 can only be addressed using its actual IP address that is for example: <http://169.254.1.1>

b) Automatic IP host and server SP3 using direct peer-to-peer cross-over cable.

“Obtain an IP address automatically” is typically the default configuration in Windows PC. In this case, SP3 should be setup as either SERVER&CLIENT (this is the default settings). It would also work under the DHCP SERVER selection.

NOTE: plugging the SP3 set up as DHCP SERVER or SERVER&CLIENT into another server based LAN (for example a typical corporate LAN) may cause some other DHCP servers to shut down¹. Therefore this scheme is recommended only for direct peer-to-peer connections, not for server based LANs!

“NetBios Name” addressing cannot be used in this scheme (for example <http://sp3-123>). SP3 can only be addressed using its actual IP address that is for example: <http://169.254.1.1>

c) Automatic IP host and client SP3, both connected to the same LAN with an already established router or a network server.

“Obtain an IP address automatically” is typically the default configuration in Windows PC. In this case SP3 **must** be setup as DHCP CLIENT Auto IP².

“NetBios Name” addressing (for example <http://sp3-123>) can be often used in this scheme, depending on the capability of the network server and the firewall settings. Using the actual IP address of the SP3

¹ Some MS Windows Server 2003 server configurations may not automatically restart their DHCP services, which requires an administrator intervention. On the other hand almost all home network routers would automatically restart their DHCP after a clash.

² DHCP SERVER&CLIENT selection would also work but is not recommended on corporate LANs due to a possibility of DHCP server disruption, see the footnote above.

APPENDIX G: SETUP USING LAN continued

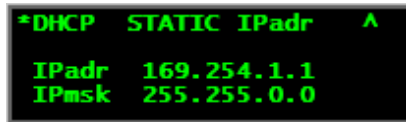
would also work (however, the actual IP address value is determined by the DHCP lease event and may vary).

2. SP3 setup for static host and static SP3.

This setup uses peer-to-peer physical connection using a cross-over³ Ethernet cable, connecting the Ethernet port on the back of SP3 unit, directly to the second LAN2 card in the host PC. To set up the SP3, press right arrow key to enter the menu system, then:

SYSTEM SETUP → MISCELLANEOUS

Scroll to the third screen down:



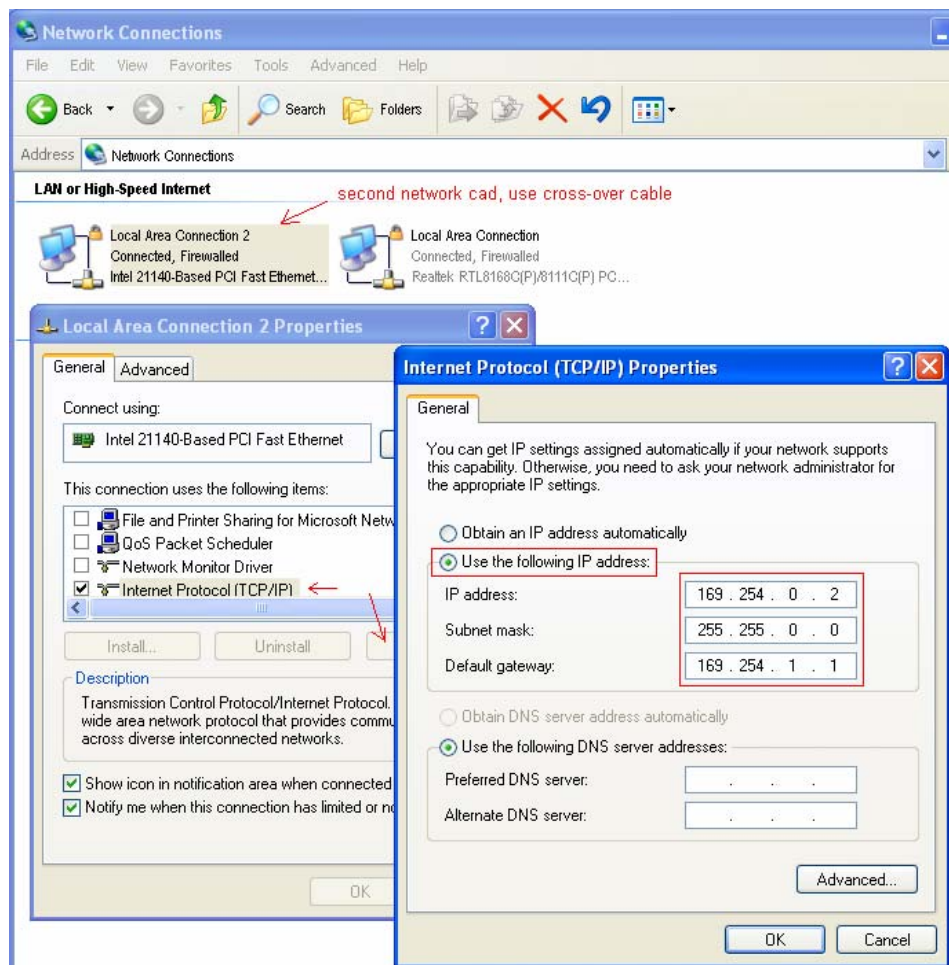
TCP/IP setup screen

Make sure that the setup screen looks on like above screen⁴. After making a new DHCP selection press left arrow key to escape back to the main screen, then press STANDBY button and then again to power up, to reset the SP3 unit.

3. Host PC setup for static IP address.

Ideally, a second network interface card (LAN2) would connect only to SP3, while the main network card (LAN) would maintain the normal network and internet connectivity. An example of the interface configuration is showed at the right:

Configuration of the second network card (LAN2) for SP3 connectivity in the static IP scheme

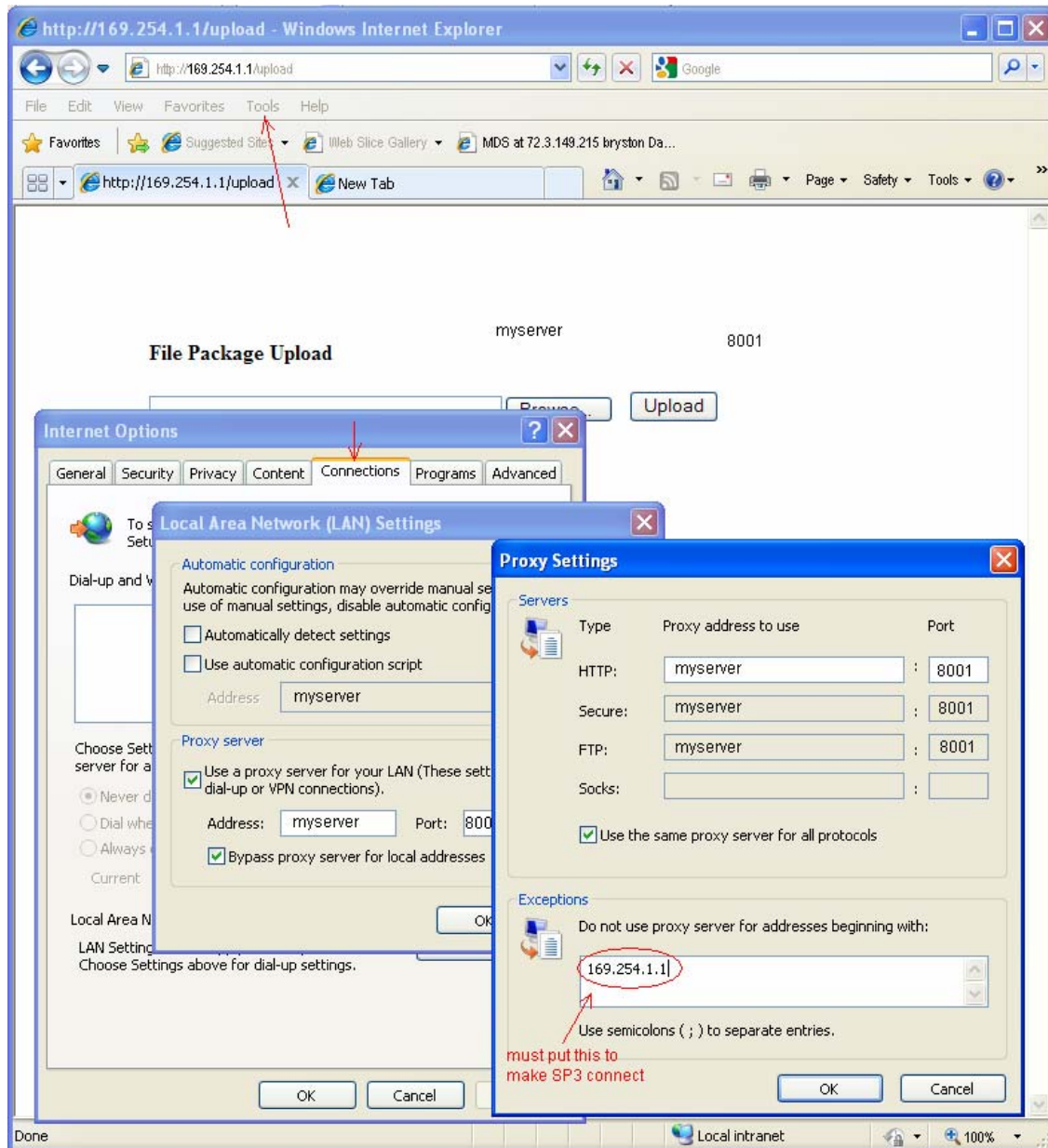


³ Some network card allow using standard (non-cross-over) Ethernet cables.

⁴ It is possible to edit and change the Ipadr or Ipmsk values but it should not normally be needed.

APPENDIX G: SETUP USING LAN continued

In order to ensure that the main LAN connection is not disrupted by the presence of a local side subnet, the main LAN card may require specifying a proxy server, and at the same time the static SP3 address must be excluded from the proxy, as showed in the following screen dump:



Configuration example of the main network card (LAN) for normal LAN connectivity, allowing for the SP3 static IP scheme.

APPENDIX G: SETUP USING LAN continued

Running ipconfig/all from the Windows (7 or XP) command line allows us to verify the connections. A typical display should look as below:

```
cmd
D:\SP3>ipconfig/all
Windows IP Configuration

    Host Name . . . . . : ST
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No
    DNS Suffix Search List. . . . . :

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Realtek RTL8168C(P)/8111C(P) PCI-E G
igabit Ethernet NIC
    Physical Address. . . . . : 00-21-85-12-
    Dhcp Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes
    IP Address. . . . . : 10.0.0.27 ← Host main LAN IP addr
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.0.0.2
    DHCP Server . . . . . : 10.0.0.2
    DNS Servers . . . . . : 10.0.0.2
    Primary WINS Server . . . . . : 10.0.0.2
    Lease Obtained. . . . . : December 15, 2011 8:14:47 AM
    Lease Expires . . . . . : December 23, 2011 8:14:47 AM

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Intel 21140-Based PCI Fast Ethernet
Adapter (Generic)
    Physical Address. . . . . : 00-C0-F0-17-
    Dhcp Enabled. . . . . : No
    IP Address. . . . . : 169.254.0.2 ← Host PC IP addr for LAN2
    Subnet Mask . . . . . : 255.255.0.0 ← SP3 IP addr
    Default Gateway . . . . . : 169.254.1.1

D:\SP3>
```

ipconfig/all screen dump

APPENDIX I

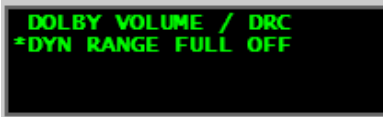
DOLBY VOLUME/DRC SETUP

DOLBY VOLUME/DRC Screen

(draft doc 25/11/2011)

1. Bringing up the Dolby Volume/DRC screen.

Pressing a down arrow key while the default (idle) screen is being displayed brings up the Dolby Volume screen for a about 10 seconds. After 10 seconds the screen reverts back to default (or when the up or left arrow is pressed).



The screen shows only one active parameter selection line:

Line 2: DYN RANGE FULL OFF

This setting (power up default) indicates that the dynamic range is full, in other words - no dynamic range compression is engaged (DRC=OFF). A selection made using this screen will remain persistent after the screen times-out back to the default display. The Dolby Volume/DRC selection will persist for as long as the source is not switched over (for example from DVD to CBL/SAT etc) and as long as the unit is not powered off or standby'ed.¹

2. Available selections.

Turning a volume control knob or pressing the SURROUND MODE left and right arrow keys causes the following selections to scroll in line 2:

DYN RANGE FULL OFF² - all dynamic range compression is off (power up default)

Dd VOL LOW FULL MODE - Dolby Volume is ON in low strength, that is the audio dynamic range is slightly reduced. The "Full Mode" (as opposed to "Half Mode") means that Dolby Volume algorithm applies both audio compression and spectral equalization.

Dd VOL MED FULL MODE - Dolby Volume is ON, medium strength (dynamic range is moderately reduced). The "Full Mode" means that Dolby Volume algorithm applies both audio compression and spectral equalization.

Dd VOL HIGH FULL MODE - Dolby Volume is ON, high strength (dynamic range is highly reduced). The "Full Mode" means that Dolby Volume algorithm applies both audio compression and spectral equalization.

Dd VOL LOW HALF MODE - Dolby Volume is ON, low strength (dynamic range is slightly reduced). The "Half Mode" (as opposed to "Full Mode") means that Dolby Volume algorithm applies only audio compression but not spectral equalization.

Dd VOL MED HALF MODE - Dolby Volume is ON, medium strength (dynamic range is moderately reduced). The "Half Mode" means that Dolby Volume algorithm applies only audio compression but not spectral equalization.

¹ It is possible to change this to be persistent through a factory setup.

² This is equivalent to DYNAMIC RANGE FULL selection in SP1.7, SP2

APPENDIX I: DOLBY VOLUME/DRC SET continued

Dd VOL HIGH HALF MODE - Dolby Volume is ON, medium strength (dynamic range is moderately reduced). The “Half Mode” means that Dolby Volume algorithm applies only audio compression but not spectral equalization.

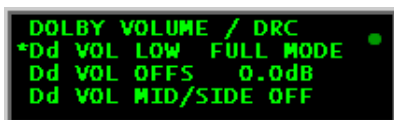
DYN RANGE MEDIUM 1 ³ – Dolby Volume is OFF but older DRC algorithm (Dynamic Range Compression) is ON resulting in medium dynamic range (moderate compression)

DYN RANGE LOW 2 ⁴ – Dolby Volume is OFF, DRC is ON producing low dynamic range (high compression).

DRC AUTO(THD,DTSHD) – Dolby Volume is OFF, DRC is ON, high compression conditional upon the presence of DYNF flag in the digital source stream.

3. Additional configuration options for Dolby Volume.

When any of the Dolby Volume selection is made, that is if line 2 selects anything from Dd VOL LOW FULL MODE to Dd VOL HIGH HALF MODE (and only those) then the additional configuration settings are displayed in the lines 3 and 4 on the screen:



Line 3: Dd VOL OFFS 0.0dB - use volume knob to adjust Dolby Volume level offset –20.0..+20.0dB. This parameter defines the maximum sound level for the recording (as it should have been listened to originally, in a studio etc). For example, when listening to a movie, this value could be increased⁵ initially during the loudest portion of the recording, to set the reference for the loudest parts. A positive VOL OFFS value makes the average output sound less loud, negative value makes it louder.

Note: Dd VOL OFFS does NOT have to be continuously adjusted during a playback; this is an optional once-off (per movie) adjustment!

Line 4: Dd VOL MID/SIDE OFF – use volume knob or SURROUND left/right arrow to toggle this parameter ON or OFF. MID/SIDE is relevant only in STEREO mode and causes Dolby Volume algorithm to automatically re-balance the left and right channels. Default is OFF.

Dolby Volume algorithm is operating only at lower sample rates <=48kHz. It is automatically disabled above 48kHz but this is not indicated on screen!

No configuration settings are available for DRC selections.

³ This is equivalent to DYNAMIC RANGE MEDIUM selection in SP1.7, SP2

⁴ This is equivalent to DYNAMIC RANGE LOW selection in SP1.7, SP2

⁵ +6dB is often sufficient to adjust the loudest movie scenes down to a comfortable level.

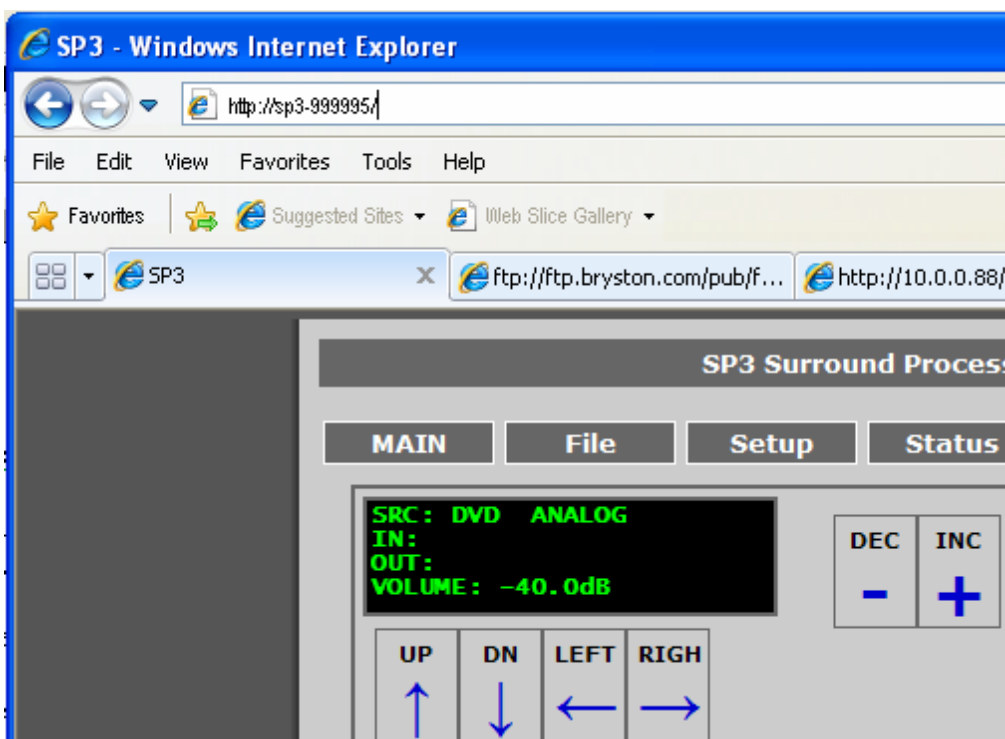
APPENDIX J

FIRMWARE UPLOAD INSTRUCTIONS

Instructions for uploading the SP3 software.

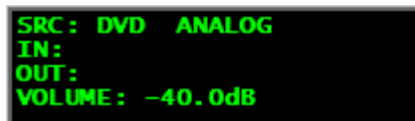
Ver .2, 23-Nov-2011

1. You must be connected to the internet and have the SP3 connected via Ethernet cable to your local area network and powered up.
2. Open a Browser on your computer (Explorer/Chrome/Safari etc)
3. Type: *sp3-serialnumber*
in the URL window in the top of the browser, for example sp3-999995 and press enter on your PC keyboard¹. The SP3 web page should open in your browser:



Main SP3 page

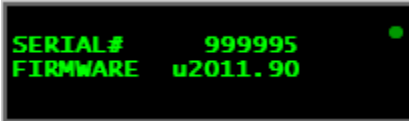
The serial number is available by pushing the left hand navigation button on the SP3 front panel, when the front panel shows the main (opening) screen:



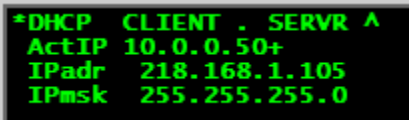
SP3 display showing the main screen

¹ Alternatively, type in the device's IP address, for example 10.0.0.50 . The IP address is shown in the Miscellaneous submenu as "ActIP" item. This method may be necessary if the network server or router fails to recognize the SP3 "netbios" name.

after presing ←



SP3 display showing serial# and firmware rev#



Actual IP address (Miscellaneous menu)²

(Note: serial number is also written on the name plate on the back of the unit)

4. Click on the File button on the screen. If the Login window opens, type the User name: *admin* and Password: *bryston* (case-sensitive)



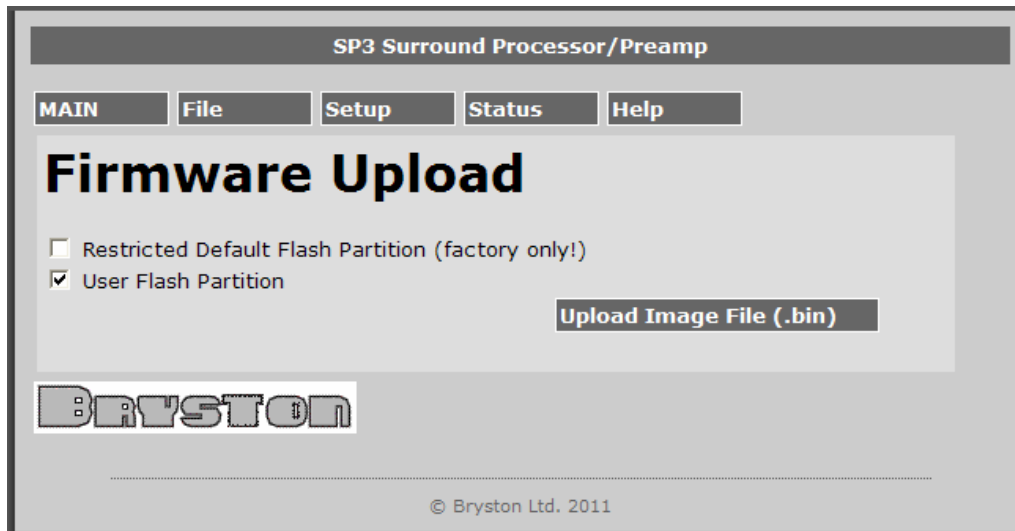
"Login" window³

² When the "DHCP Client & Server" option is selected (recommended!), then the "+" suffix at ActIP indicates that connection has been established while "-" indicates a failed or default status.. Ipadr and IPmsk settings are ignored in Client & Server.

³ This example screen was for a serial number equal 5. The Login window will open only once and will be valid for the entire session (even if repeated), until the browser is closed.

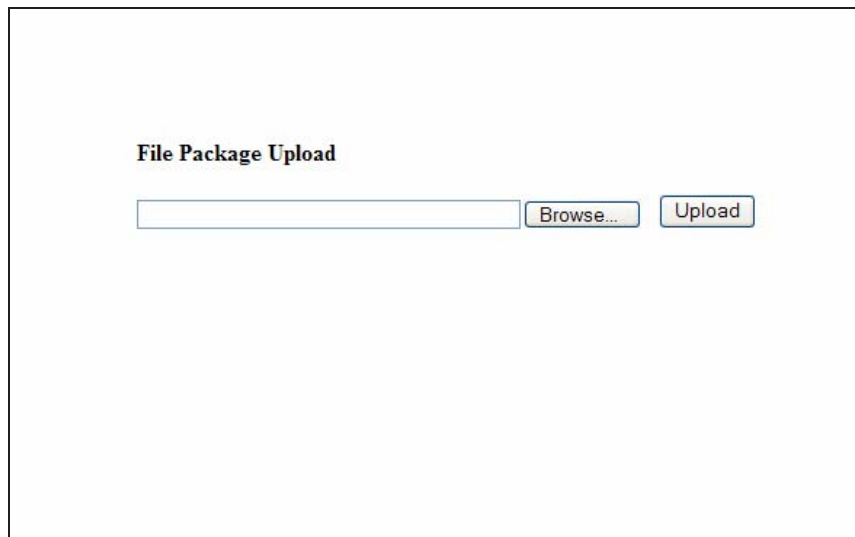
APPENDIX J: FIRMWARE UPLOAD INSTRUCTIONS continued

The following firmware upload screen will open:



“Firmware Upload” page

5. Click on the “Upload Image File (.bin)” button to open the next screen:

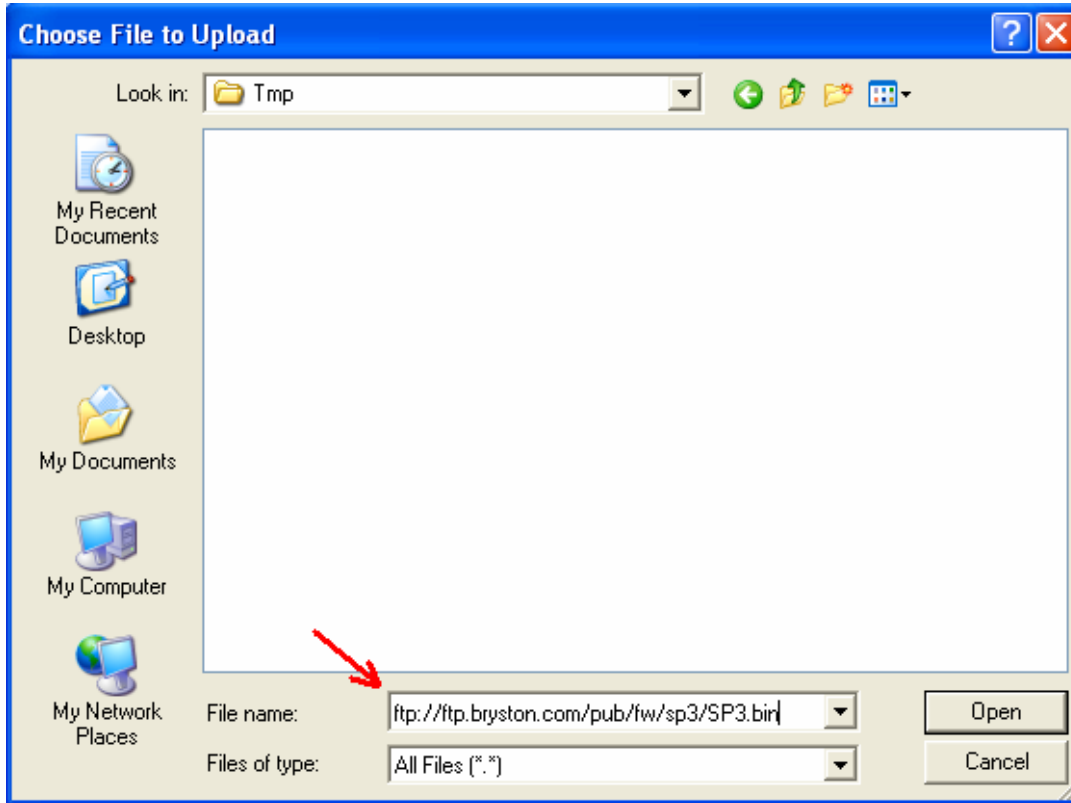


“File Package Upload” page of the SP3.

6. Click on “Browse” button to select the file, and type the following file path exactly as it is below (case-sensitive!):

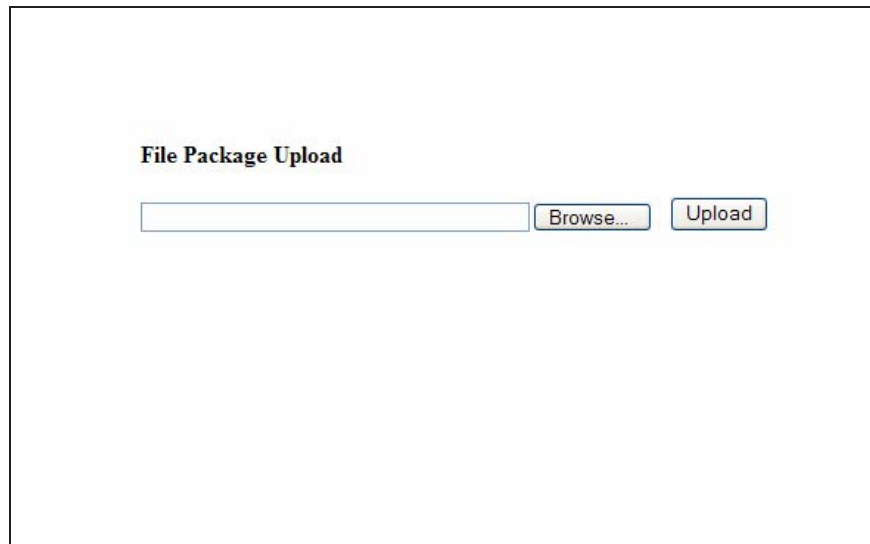
<ftp://ftp.bryston.com/pub/fw/sp3/SP3.bin>

into the “File name” line as below, then click “Open” or press Enter.:



“Choose File to Upload” window (will close when Open is clicked)

7. After selecting the SP3.bin file, click on the “Upload” button in the “File Package Upload” window:



“File Package Upload” page of the SP3.

APPENDIX J: FIRMWARE UPLOAD INSTRUCTIONS continued

The file upload starts after a few seconds⁴ (The file is read from a remote server and that requires internet connectivity!)⁵

There is NO indication in the web page on computer that an upload is in process – the LED blinking and the display on the SP3 will indicate the upload status.

Wait⁶ until the file gets uploaded to SP3 and until the self-programming process is completed.⁷ SP3 will automatically load, self-program and re-power up after the programming is finished.

Do not unplug or power off the unit and wait ten more seconds for the Standby LED to go dark after the main screen shows up, before using the SP3. Press the left arrow on the front panel to display the serial number and firmware revision, verifying that the revision number has been updated.

Note: If the internet connectivity fails due to firewall or other reason, then a “file not found” or other error will be shown and the process will be terminated.

In such a case a new SP3.bin file can be obtained (by post etc) from Bryston technical support and copied into a local directory (for example, to Desktop). From there it can be selected from the “Choose File to Upload” window like above.

⁴ In Windows, the remote file SP3.bin will be automatically copied after being selected, into a local directory thus the actual file path shown in the “File Package Upload” window will be pointing to some local temporary directory rather than showing the original remote ftp path. This is a normal behavior (in WinXP).

⁵ Alternatively, SP3.bin file may be sent by email or physically in a CD or USB drive. In such a case copy the file into a local directory (for example Desktop) and then pick that file rather than using the ftp path.

⁶ Typically about one to two minutes. Ignore error messages that may appear in the browser window during programming stage, due to time-out.

⁷ Uploading is marked by a live time count on the SP3 front panel screen but during the last self programming stage the screen goes blank while the Standby LED will be flashing some red, yellow and green patterns (or red, violet and blue). Do not power off while self-programming is taking place!

A large area of the page is filled with horizontal lines, providing space for handwritten notes or a signature.