BRYSTON

SP3

**PREAMP /
SURROUND PROCESSOR**

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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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 TOSLINK input, connect it initially to SPDIF-1 or TOSLINK 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 assigned 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:

```
SRC:
IN:
OUT:
VOLUME:
```

• *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

```
MAIN MENU
➜  SYSTEM SETUP
    SOURCE SETUP
```

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 ◀ .

```
MAIN MENU
    SYSTEM SETUP
➜  SOURCE SETUP
```

For more information on the menu system, see pg 12

FRONT PANEL

A: ALPHA NUMERIC DISPLAY	E: HEADPHONE JACK
B: MENU NAVIGATION Buttons	F: OUTPUT SELECT Buttons
C: FUNCTION & OPERATION Buttons	G: INPUT SELECT Buttons
D: VOLUME CONTROL	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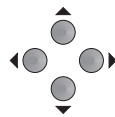) can be used to set most parameters, even on/off choices. The two *Surround Mode* buttons can also be used to choose from preset value options.

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 n the SYSTEM SETUP -> MISC. menu. Choosing DISP+LED TOUT instead of DISP TIMEOUT will apply the display time-out 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

A

B

SP3 SURROUND PROCESSOR/PREAMP

```
LINE 1:
LINE 2:
LINE 3:
LINE 4:
```

DISPLAY

BRYSTON

DVD   CBL/SAT   TUNER   CD

HDMI   1   2   3   4

H
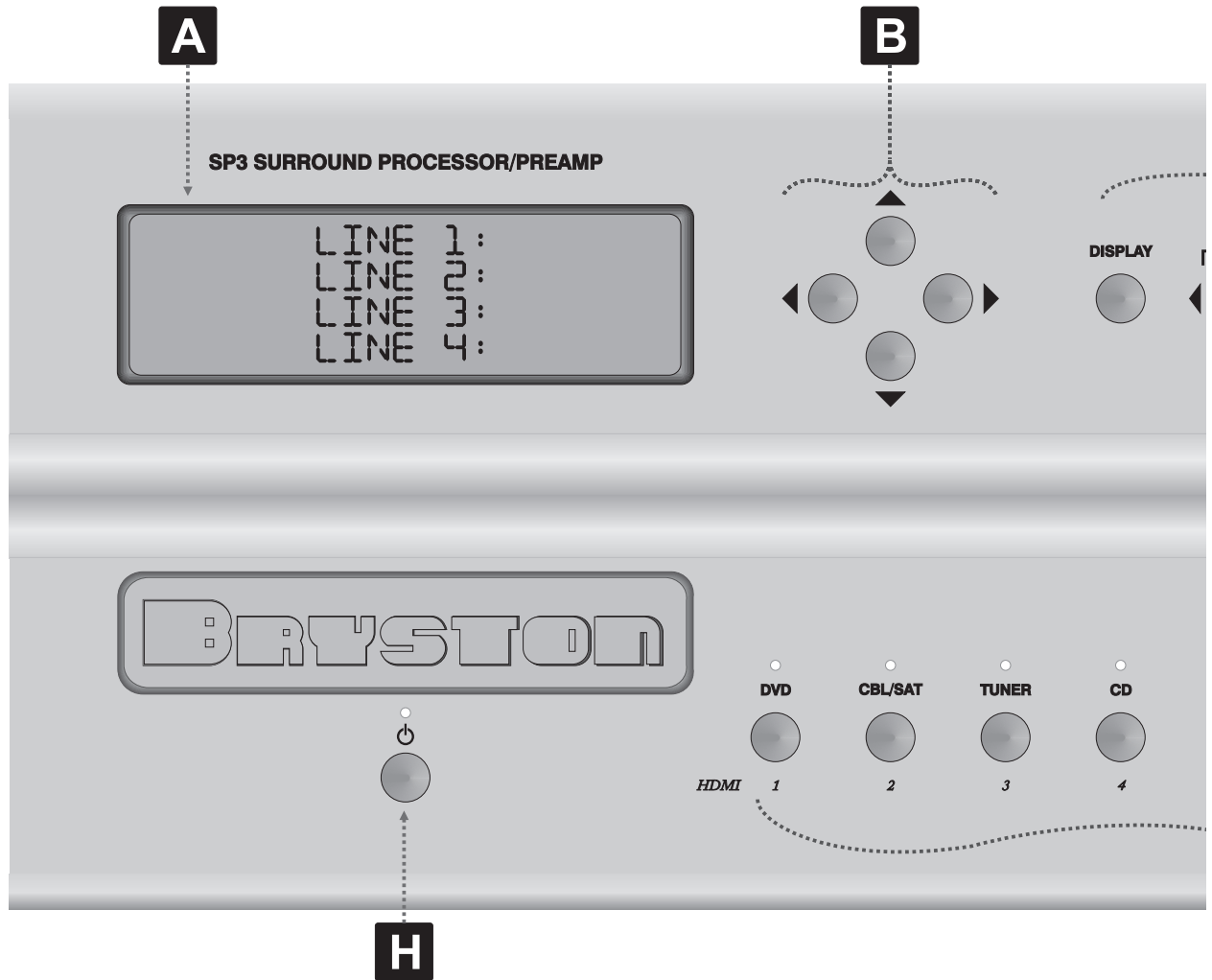
down-mix into a stereo Left and Right output.

■ STEREO & STEREO DOWN-MIX MODE
If this button is selected and the supplied bitstream 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 Digital program, some channel combining will be necessary 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.
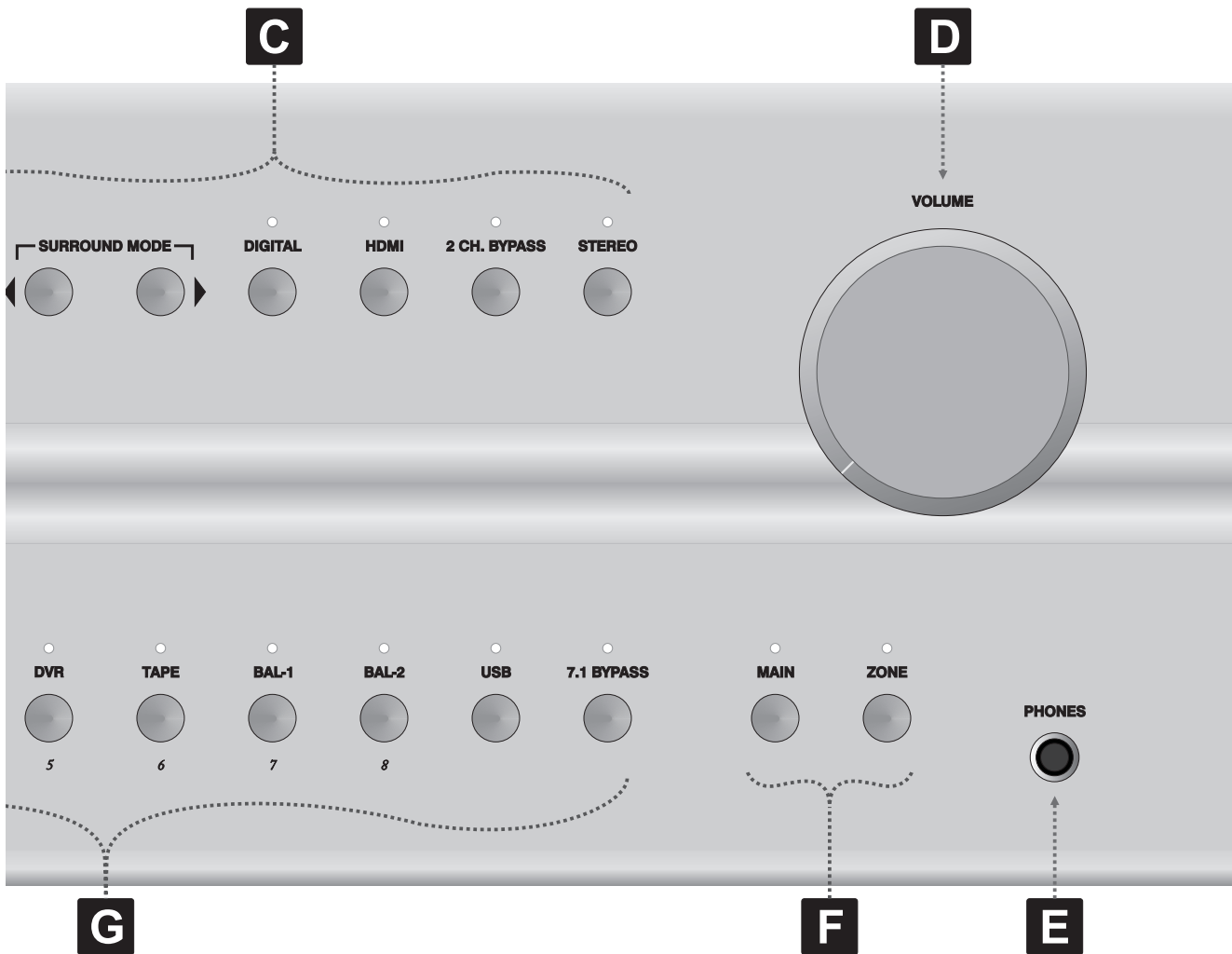
H: STANDBY BUTTON

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 theses different colour states is significant only to engineering and service personel.

Power consumption in Standby mode is <1 Watt.

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

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REAR PANEL

1: **SINGLE ENDED ANALOG OUTPUTS**
2: **HDMI INPUTS**
3: **ZONE-2, SINGLE ENDED, ANALOG OUTPUTS**
4: **1st ANALOG TAPE LOOP IN/OUT CONNECTORS**
5: **2nd ANALOG TAPE LOOP IN/OUT CONNECTORS**

6: **SINGLE ENDED ANALOG INPUTS**
7: **SPDIF INPUTS**
8: *DATA PLATE* **LABEL**
9: **CAUTION, RECYCLING & OTHER SYMBOLS**
10: **IEC-320 C14 POWER INLET**
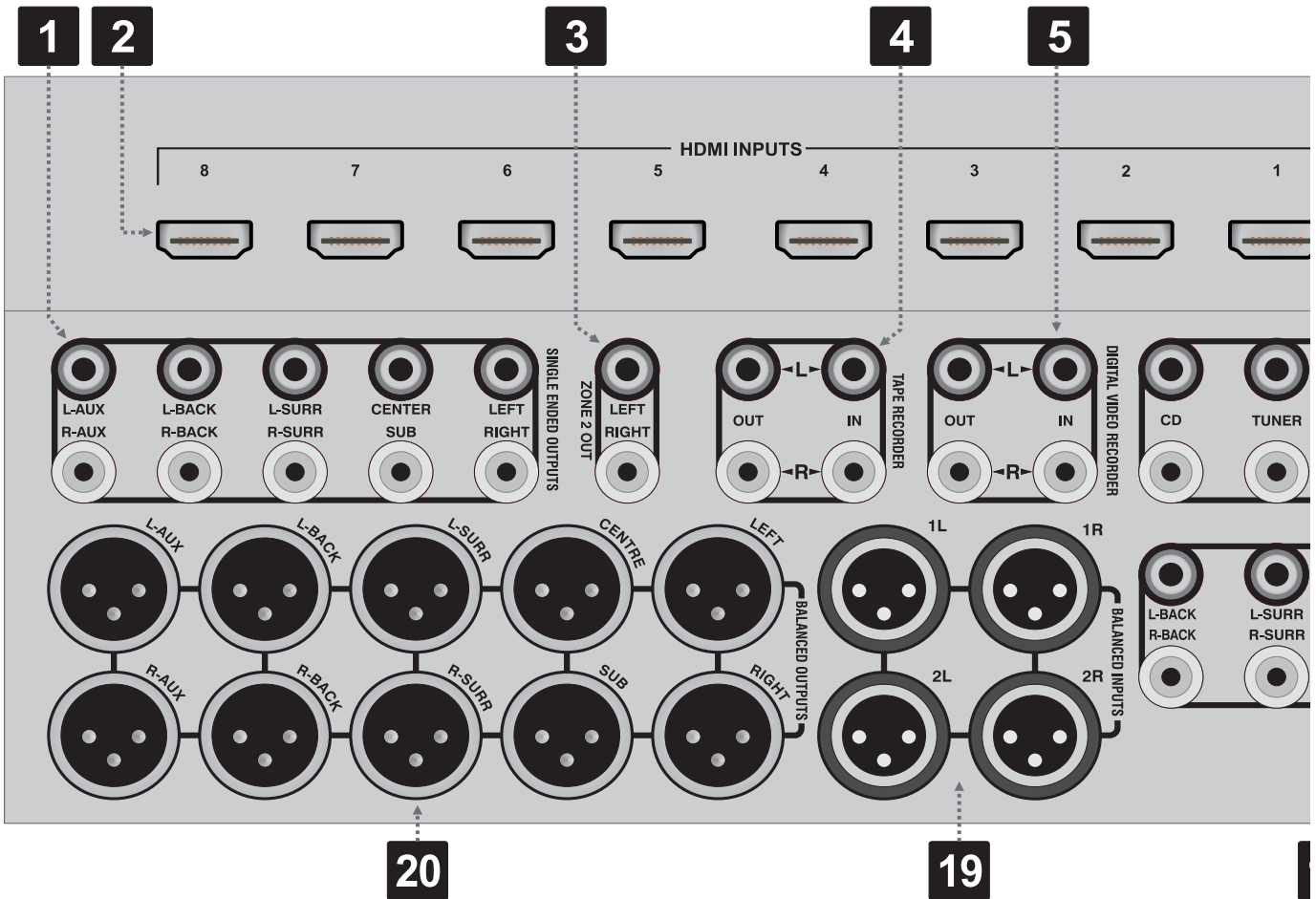
1: **SINGLE ENDED ANALOG OUTPUTS**
   The SP3 offers both balanced (3 pin XLR male connectors [pin 2+, pin 3-] and unbalanced (RCA/phono jacks) output connectors.

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.

6: **SINGLE ENDED ANALOG INPUTS**
   Four pairs of general purpose analog inputs labelled CD,

07

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

6 **7** **8** **9** **10** **11** **12**

HDMI OUTPUTS
1   1   2

DATA PLATE

CAUTION
RISK OF ELECTRIC SHOCK - DO NOT OPEN
PRECAUTION
RISQUE DE CHOC ELECTRIQUE. NE PAS OUVRIR

⚠ ⚠ CE ⌧

IEC 320-C14 POWER INLET

SINGLE ENDED INPUTS
◄L► ◄R►
TUNER   CBL/SAT   DVD

SPDIF INPUTS
1 3
2 4

USB

RS232 Serial

ETHERNET

TOSLINK OPTICAL

7.1 SURROUND INPUTS
L-SURR   CENTER   LEFT
R-SURR   SUB   RIGHT

AES INPUTS
1
2

INFRA-RED INPUT

OUTPUT   INPUT-1   INPUT-2   INPUT-3

BRYSTON
SP3
SURROUND SOUND PROCESSOR
Made in Peterborough, Ontario, Canada

TRIGGERS
OUT-1   OUT-2   OUT-3   IN

18 **17** **16** **15** **14** **13**

TUNER, CABLE/SAT, & DVD. Input voltage should limited to less than or equal to 5VRMS 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 personel. 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 an an HTTP server. See Appendix H for more info.

N.B. By default "Ethernet In Standby" mode is set OFF to enable compliance with international standby power requirements.

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-conducter 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

<u>Remote Trigger Hookup Options</u>

3.5mm 2-conductor phone plug — 0V (gnd) / +12Vdc

3.5mm 3-conductor phone plug — 0V (gnd) / N/C / +12Vdc
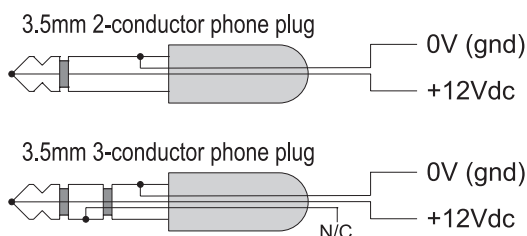
The three outputs can be programmed to go either high (+12Vdc, ±0.6V) or low (gnd) when specified inputs are selected. These assignments are found in the SOURCE menu (SOURCE ➜ TRIGGERS).

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 an 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 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 head-

phone 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

⚠ 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:

	120V models	220-230V models
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	F 800mA 250V
Part numbers:	Littelfuse 217 01.6	Littelfuse 217.800

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.

F1: MAIN FUSE
120Vac models: F 1.6A 250V
(Littelfuse 217 01.6)

220-230Vac models: F 800mA
250V (Littelfuse 217.800)

F2: STANDBY FUSE
For all models:
models: F 500mA 250V
(Littelfuse 217.500)
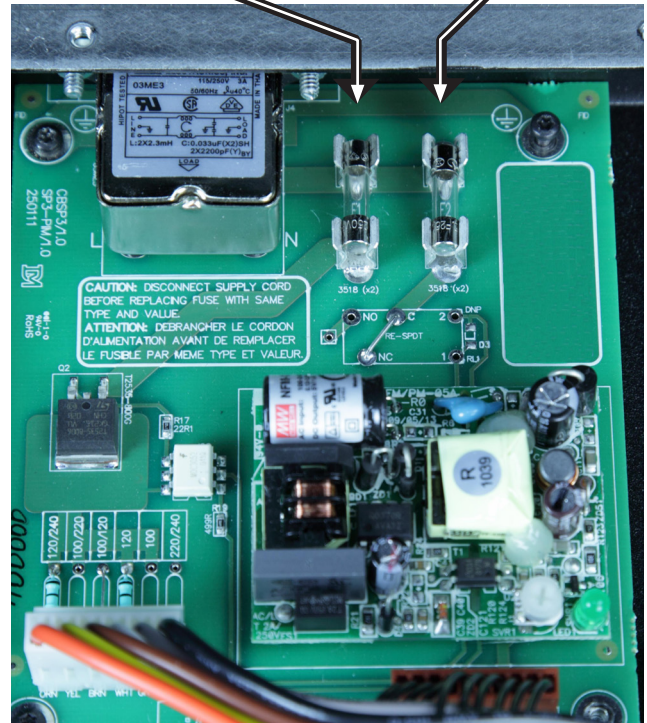
MODEL PART NUMBERING SCHEME

Model part numbers follow this scheme:

MODEL GROUP	DRESS PANEL WIDTH	DRESS PANEL COLOR	AC LINE VOLTAGE
SP3 -	17 -	SIL -	120

The example at the left indicates an SP3 with a 17 inch wide silver (clear aluminum anodized) dress panel with a line voltage of 120VAC.

Dress panels are available in 17 and 19 inch widths in either a clear aluminum (SIL) or non-gloss black (BLK) finish. Available AC line voltages include 120, 220-230 & 240.

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 con-firm 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 differece 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

SP3 IR-CODES (updated 7-Aug-2013)

Function	Code	Function	Code	Function	Code	Function	Code
Reserved (was PwrOff)	000	Mode None	064		128		192
Source TV/SAT	001	Dolby Pro Logic	065		129		193
Source DVD	002	PLII Music	066		130		194
Source CD	003	PLII Movie	067		131		195
Source TUNER	004	Neo-6 Music	068		132		196
Source DVR	005	Neo-6 Movie	069		133		197
Source TAPE	006	Stereo 7	070		134		198
Volume Up	007	Party	071		135		199
Volume Down	008	Hall	072		136		200
Mute Toggle	009	Church	073		137		201
Pink Noise Test	010	Stadium	074		138		202
Digital Toggle	011	Club	075		139		203
Dolby EX Force/Auto	012	Theatre	076		140		204
Stereo Toggle	013	Natural	077		141		205
Zone / Mute Toggle	014	Dolby Digital 5.1	078		142		206
Power On/Off	015	Dolby Digital EX Movie	079		143		207
DTS ES Force/Auto	016	PLIIx Music 6	080		144		208
	017	PLIIx Movie 7	081		145		209
	018	PLIIx Music7	082		146		210
Menu Up	019	PLIIx Auto	083		147		211
Menu Down	020	Stereo7	084		148		212
	021	HDMI Toggle	085		149		213
Centre	022	Source BAL-1	086		150		214
Side Surround	023	Source BAL-2	087		151		215
Back	024	Source USB	088		152		216
Subwoofer	025	Main / Mute Toggle	089		153		217
Save, Exit Menu	026		090		154		218
2-Ch Bypass Toggle	027		091		155		219
Source 7.1 Bypass	028		092		156		220
Power On	029		093		157		221
	030	Surround Left	094		158		222
	031	Surround Right	095		159		223
	032	Menu Left	096		160		224
	033	Menu Right	097		161		225
	034		098		162		226
	035		099		163		227
	036		100		164		228
	037		101		165		229
	038		102		166		230
	039		103		167		231
	040		104		168		232
	041		105		169		233
	042		106		170		234
	043		107		171		235
	044		108		172		236
	045		109		173		237
	046		110	Power OFF	174		238
	047		111	Power ON (reserved)	175		239
	048		112	DISPLAY Toggle	176		240
	049		113	Default EEPROM	177		241
	050		114		178		242
	051		115		179		243
Mono	052		116		180		244
2-Ch Bypass On	053		117	Test LEDs	181		245
	054		118		182		246
2-Ch Bypass Off	055		119		183		247
Digital On	056		120		184		248
Digital Off	057		121		185		249
Mute On	058		122		186		250
Mute Off	059		123		187		251
Bypass Subw On/Off	060		124	Default TCP/IP	188		252
	061		125		189		253
	062		126		190		254
	063		127	Reserved (was REBOOT)	191		255

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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.

CODE   POWER

TEST	DTS	DD	▲
1	2	3	
2-CH	HDMI	DIG	VOLUME
4	5	6	
◄ SURR ►	STEREO	MUTE	
7	8	9	0

◄   ▲ MENU ▼   ►

DVD	SAT	TUNER	CD
DVR	TAPE	BAL1	BAL2
USB	7.1	MAIN	ZONE

BRYSTON
BR3

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.

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 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 form *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 > 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

MENU TREE NOTES continued:

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:	120, 220 & 240Vac models. Maximum power consumption: 65 Watts Standby power consumption: <500mWatt

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 Auxil-
                        iary and Subwoofer
                        16 sindle ended (unbalanced) RCA:
                        Left, Centre, Right, Left Surround, Right Surround, Left Back, Right Back, Left Auxiliary, Right Auxil-
                        iary & 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 auxilliary 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.
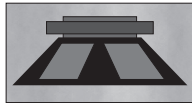
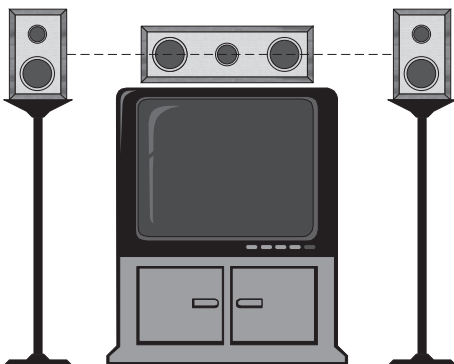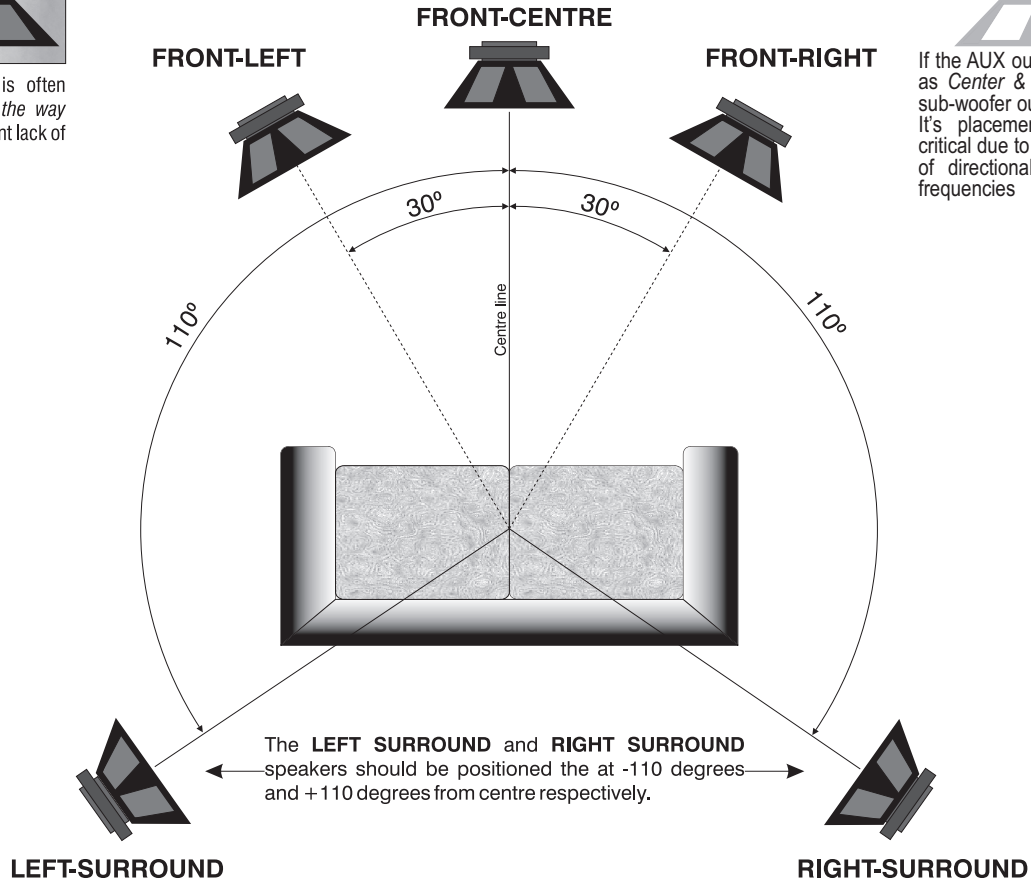## TRADEMARK ACKNOWLEDGEMENTS

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

FRONT-CENTRE

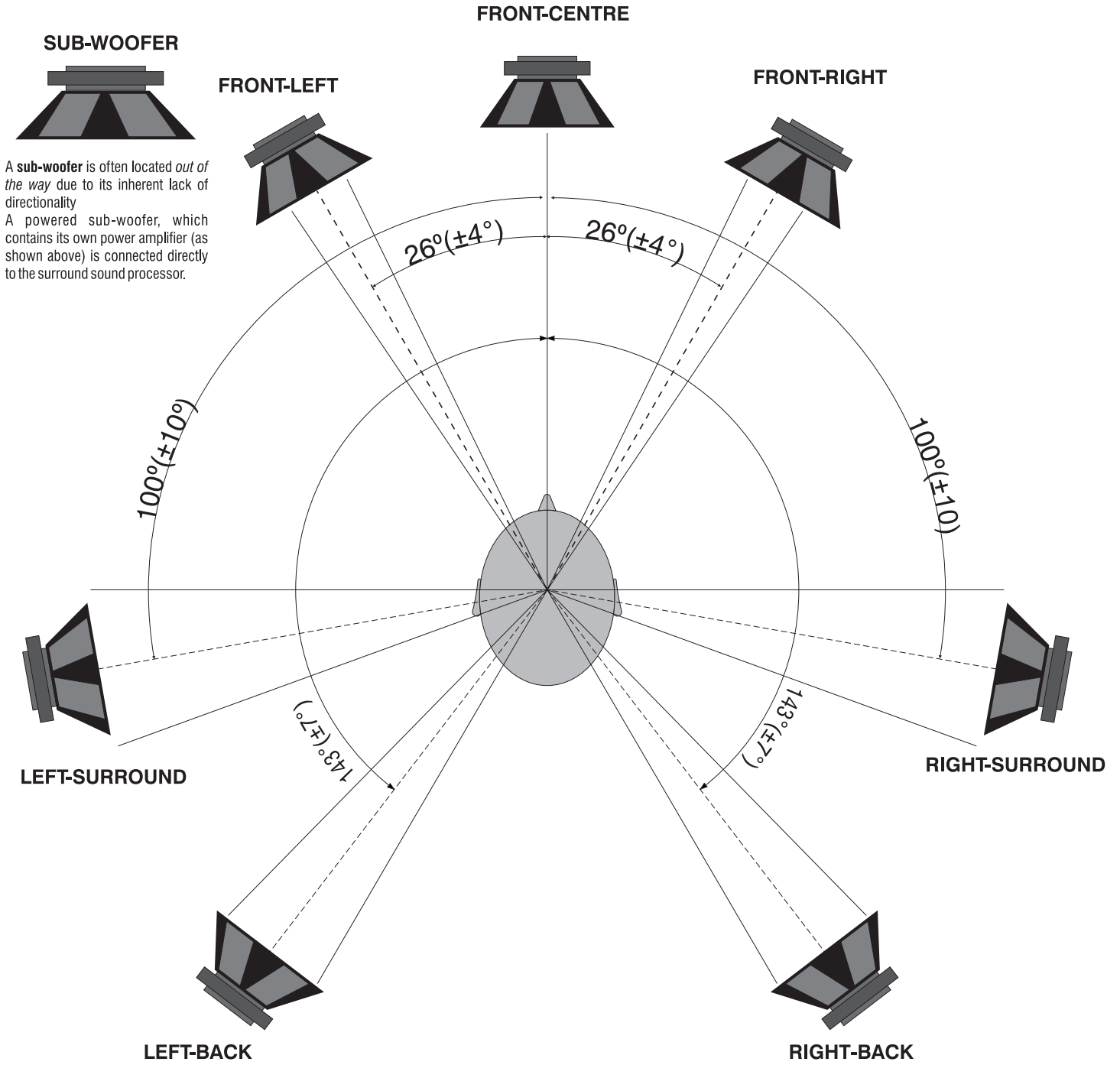**FRONT-LEFT**

FRONT-RIGHT

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

30°

30°

Centre line

110°

110°

The **LEFT SURROUND** and **RIGHT SURROUND** speakers should be positioned the at -110 degrees and +110 degrees from centre respectively.

LEFT-SURROUND

RIGHT-SURROUND

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

SUB-WOOFER

FRONT-CENTRE

FRONT-LEFT

FRONT-RIGHT

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.

26°(±4°)   26°(±4°)

100°(±10°)   100°(±10)

143°(±7°)   143°(±7°)

LEFT-SURROUND

RIGHT-SURROUND

LEFT-BACK

RIGHT-BACK

SP3 EXTERIOR DIMENSIONS

16.975

2.488   12.000   2.487

RCA Jacks
0.475

2.000   2.000

10.200   *Top View*   14.000   14.250   15.595

2.487

RUBBER FEET
1.5" Dia X 0.75" high

1.800   1.800

2.000   1.125

Front Panel   VOLUME KNOB   0.875   0.250

2.488

17.000   *17 inch dress panel*
19.000   *19 inch dress panel*

15.600
14.250

0.265   0.375
0.700
1.610
0.475
6.235   *Side View*   5.970
5.220
4.145
0.875
3.675
0.485   0.750   0.750

SP3 OWNER'S MANUAL
APPENDICES

BRYSTON

APPENDIX A

SP3 SURROUND MODES

Pressing the SURROUND left (◄) and right (►)arrow buttons button 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: PLɪɪ 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.

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

PLɪɪ 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 (updated 2013-08-12)

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
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,
                 or go from Zone to
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

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 Dolby Pro Logic Music
- 03 Dolby Pro Logic II 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 Digital 5.1 (no back)
- 22 Dolby Digital EX 6.1 Movie
- 23 Dolby Pro Logic EX 6.1 Music
- 24 Dolby Pro Logic IIx ex 7.1 Movie
- 25 Dolby Pro Logic IIx ex 7.1 Music
- 26 Dolby Pro Logic IIx 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 DDVLxxxxxxx
- 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 Digital)
    - 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 Digital Plus)
18: DTS HD or Master
19: Dolby TrueHD
1a: DXP (DTS Express)

AFMT   Query Input Format PFMTxxxxxxxx
    (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

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

OUTP   Query Output Format OUTPxxxxxxx
    (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
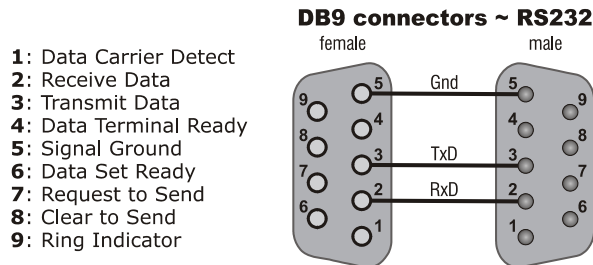(09-Jan-2012, Stan B., Bryston Ltd.)

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-feedback [2]
   ON+AUTOFB   - RS232 port is ON with auto-feedback[3]

2) RS232 BAUD: 9600/19200/38400
      - baudrate selection (default is 9600)

Connector diagram

1: Data Carrier Detect
2: Receive Data
3: Transmit Data
4: Data Terminal Ready
5: Signal Ground
6: Data Set Ready
7: Request to Send
8: Clear to Send
9: Ring Indicator

DB9 connectors ~ RS232

female   male

Gnd — 5 to 5
TxD — 3 to 3
RxD — 2 to 2

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

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[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

SP3 – HDMI Notes (1)
2-Aug-2012,
Stan Bleszynski, 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 sources (players)

If two 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 multichannel 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 analog[2] 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.

---

[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.

Selecting HDMI inputs on SP3

Normally, HDMI inputs are associated with the corresponding source selector buttons on the front panel, from left to right. DVD button is associated with HDMI input1, CBL/SAT button with HDMI 2, ... BAL-2 with HDMI 8. For each of the first 8 source selector buttons there are 3 alternative inputs sockets to chose from: DIGITAL[3], HDMI or analog[4]. Selecting of a different source button causes the previous HDMI input to be disabled and the new associated HDMI input to be automatically selected and enabled for video and audio pass-through on that input[5], even if the HDMI button is not selected. If the new HDMI input is selected then the video is passed-though while audio is intercepted by the SP3. This behaviour can be modified in the firmware revision 2012.08 or later, with the introduction of HDMI INPUT STICKY option in MISCELLANEOUS menu[6]. When the "STICKY" selection is made then the last selected HDMI input remains selected and active even after switching to a different source, for as long as the new source selection does not select HDMI explicitly. It persists through power downs. It allows displaying video image from one source player, while playing audio from another.

HDMI multi-channel 7.1, 5.1 or two-channel formats.

The signal source determines the channel format. If the number of channels being played is not as expected, for example 2 instead of 5.1 or 7.1 then the SP3 and the player may have to re-handshake the communication protocol through HDMI in order to reset the proper status. Certain media (DVD, BD) revert to a 2 channel audio format during menus and then switch to multichannel when playing a selected contents. Some media contents may be originally recorded as 2 audio channels, in this case one can use the surround synthesis[7] feature in the SP3 to re-create 5.1 or 7.1, for example select Dolby Prologic IIx Movie etc .

A player (the HDMI "source") will communicate ("handshake") with the SP3 (the "repeater") and the TV screen (the HDMI "sink"), trying to set itself up to output the

---

[3] Pressing DIGITAL button selects one of the following seven digital inputs: SPDIF1,2,3,4 or Toslink 1,2 or 3. The specific assignment determining which of the seven inputs is used, can be configured in the SYSTEM SETUP-->DIGITAL SOURCES submenu..

[4] Analog inputs are selected when neither DIGITAL nor HDMI LED are lit. Analog input has two modes of operation: normal when the signal goes through A/D, DSP and D/A with all the surround processing available, and 2 channel bypass mode selected by 2 CH.BYPASS button, when the signal bypasses the digitization stage, while only going through analog the volume control stage.

[5] Video passes through from one selected HDMI inputs 1 to 8 to both HDMI output sockets 1 and 2, operating in-parallel. It is possible to drive two TV screens simultaneously.

[6] The screen is locked, to unlock it scroll down to the 3-rd MISC screen down from the top and press ZONE,DVD and TAPE buttons in a sequence in this order.

[7] 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.

highest resolution (video) and the highest number of audio channels that the SP3 declares as available, and the highest sample rate[8] that is available in the media being played, still supported by both the SP3 and a TV screen 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) become the limiting factor preventing establishment of the highest possible video mode. In such cases the source device will often negotiate a lower video or audio resolution format than the one that is possible over a shorter or a higher quality cable[9].

Because the source-repeater-sink setup is capable of dynamically configuring itself over HDMI as a whole, it may result in very different behavior than if the same devices were connected using a different method, for example video through DVI and audio through SPDIF, Toslink or analog RCA.

For example, if a multi source is being played and the audio receiver (SP3) suddenly changes from multichannel speaker configuration, to 2 channels, which happens when the headphones are plugged into headphone jack on the SP3 or when STEREO button is pressed, then most players would automatically downmix the stream being played to stereo, on-the-fly.

> With HDMI it is the player which typically downmixes the program format to stereo when headphones are plugged to SP3. Without HDMI the downmixing to stereo takes place in the SP3 rather than in the player.

PCM versus "bitstream"

Most DVD and Blue-ray players can be configured to output audio contents either as PCM (or "Linear PCM") or as "bitstream".   The former option makes the player decode and covert 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 "bitstream" option relies on the audio decoding being performed in the SP3, and ensures the highest quality.   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 "bitstream" player setting.

---

[8] 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 the clock frequency of the bits within each data frame. For example, for CD disk the bit clock is 2.822MHz.

[9] 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.

> Note: some Blue-Ray players tend to block Bitstream selection, performing automatic conversion to PCM, when Secondary Audio Output option is enabled!

References:

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

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

APPENDIX E

SP3 – User's Instructions for USB
(2012-07-31, 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:
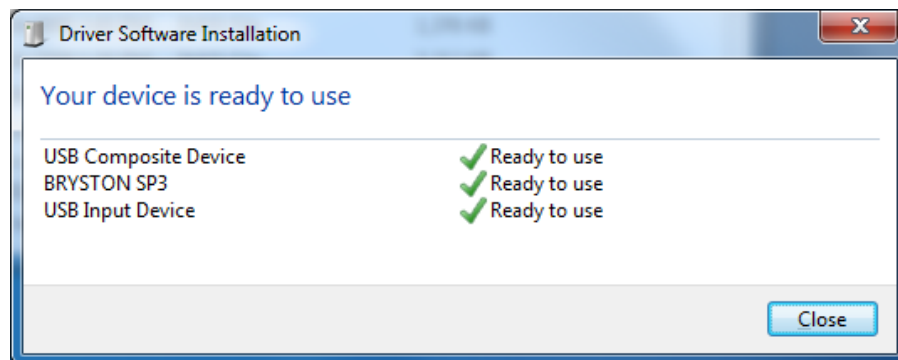
Message screen on USB connection event.
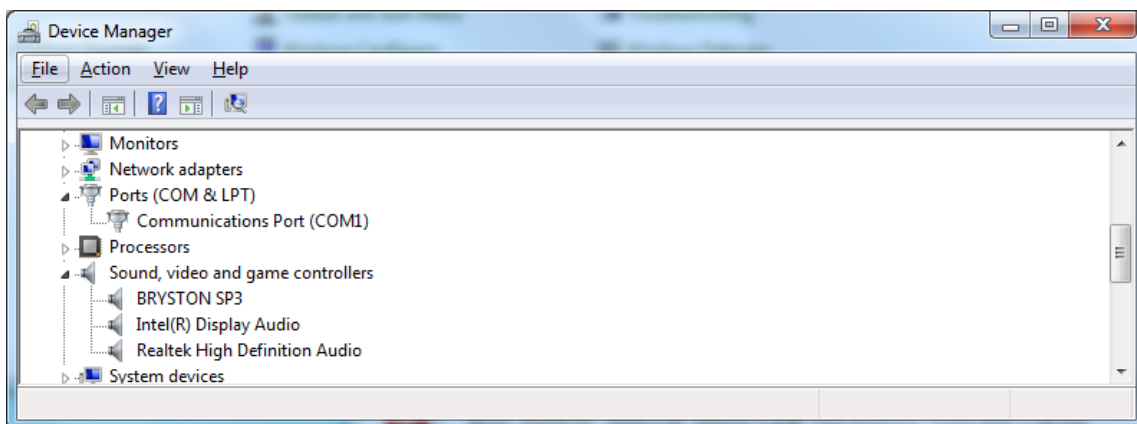
Device Manager window (Control Panel).
See BRYSTON SP3 item under "Sound, video and game controllers" section. If this is not present as illustrated above, then the SP3 USB port is not connected or not recognized by the operating sustyem.

Selecting "BRYSTON SP3" as the default Audio Device.

Sound Manager window (from the System Tray)
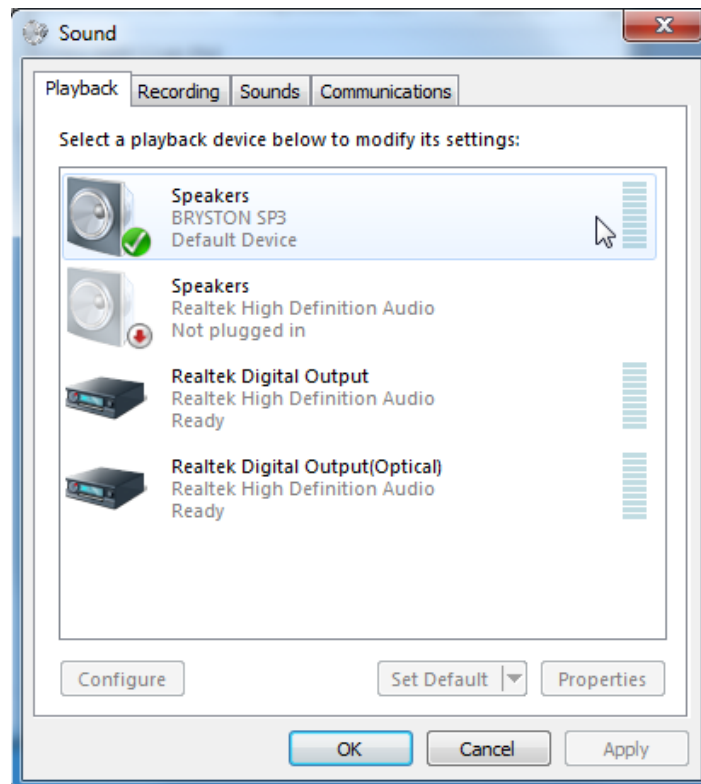
Click on the "Speakers/BRYSTON SP3" line to make this the default.

APPENDIX E: USB GUIDE continued

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.

Configuring MAC OS for USB streaming to SP3.

The idea is the same as in Windows, that is Bryston SP3 has to be selected as the output audio device. The following screenshots illustrate the necessary steps:
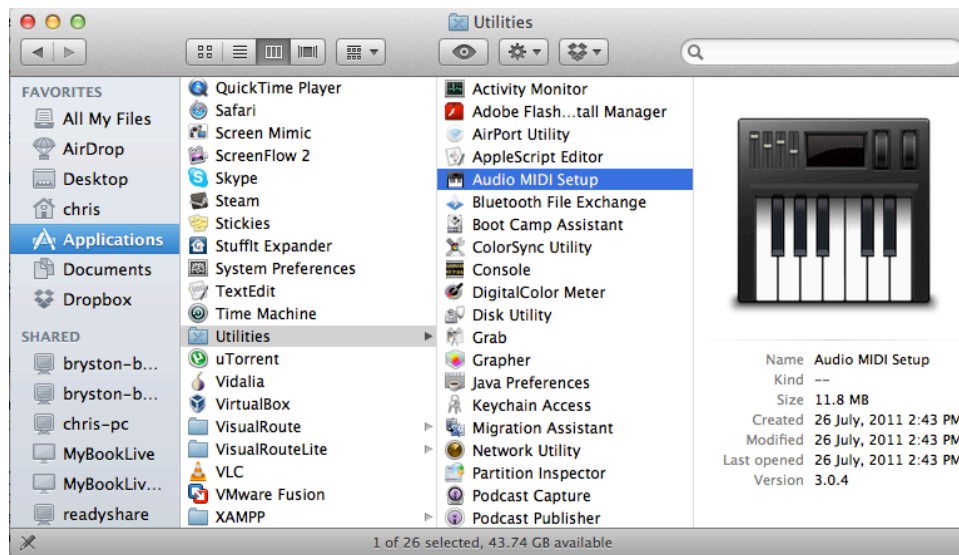
Step 1 - In Utilities select Applications, then Audio MIDI Setup
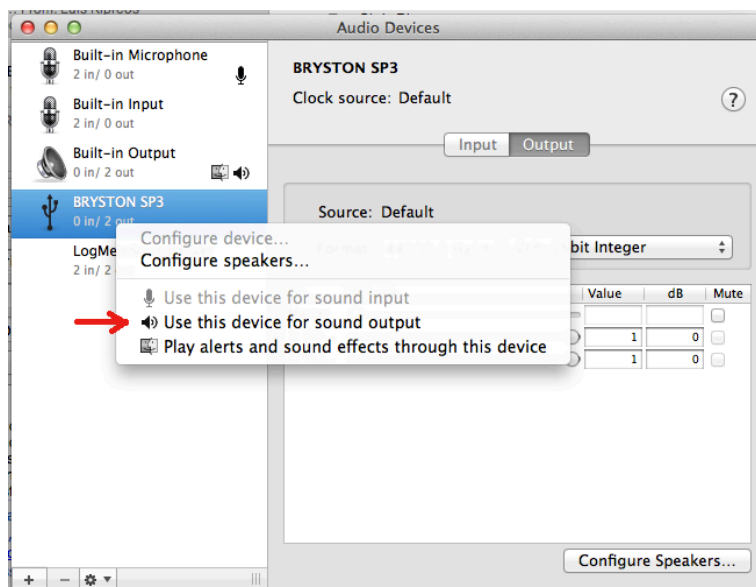
Step 2 - Select BRYSTON SP3 and "Use this device..."

SP3 Web Interface Guide

2012-08-02, Stan Bleszynski, Bryston Ltd.

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 cable. 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 by an external or internal DHCP server.   This is described in more details in the following document on-line:

ftp://ftp.bryston.com/pub/firmware/sp3/doc/SP3_setup_using_LAN2.doc
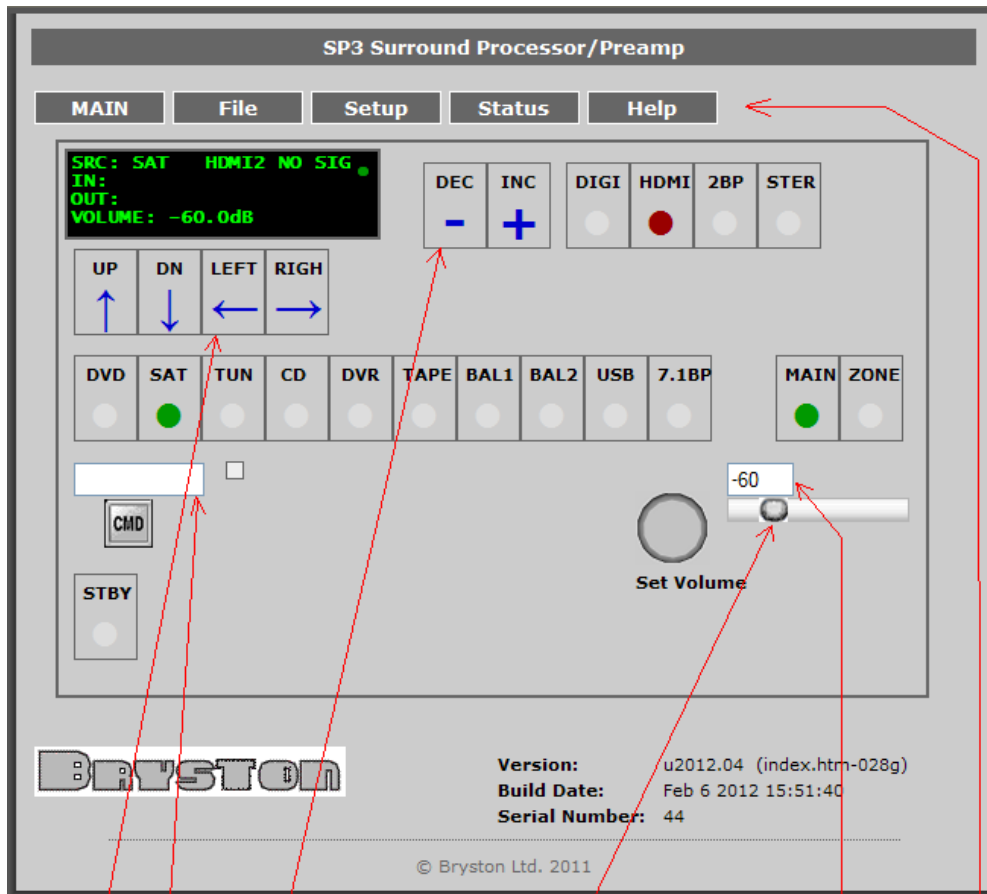
Main SP3 web interface screen

2. Main screen.

Communication interface with the SP3 takes place over TCP/IP stack using HTTP (version 2 compat) protocol over port 80. This can be handled by almost any internet browser, for example Internet Explorer, Chrome, Safari, Firefox, Opera, and on any operating system platform.   Once a connection is established, so-called "Net

APPENDIX F: WEB INTERFACE GUIDE continued

Bios Name" of the SP3, or its IP address in the browser URL window and pressing enter, should bring on the following screen:

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[1]. 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.

---

[1] In the new firmware revision (from 2012.08+), an alternative user name of bryston with the same password bryston, will also be accepted
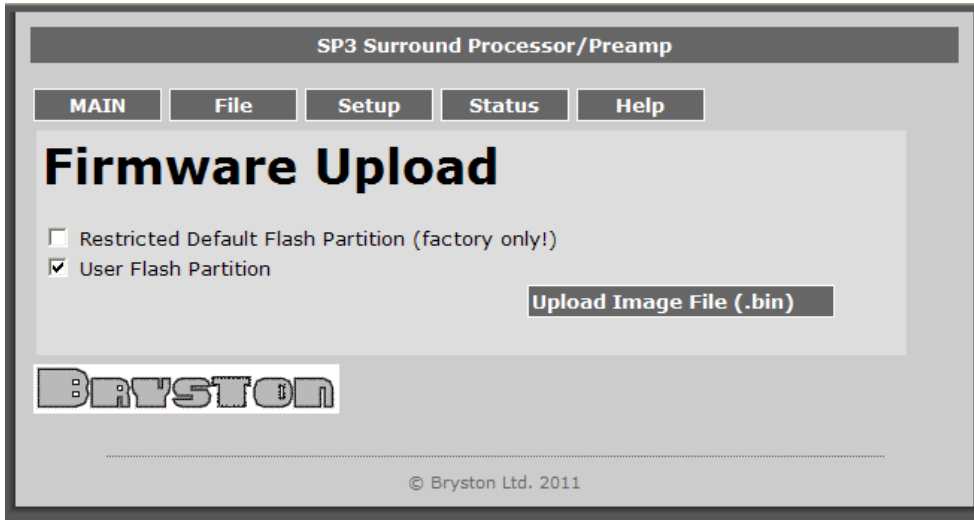
Firmware Upload screen

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/firmware/sp3/doc/SP3_Firmware_Upload_Instructions.doc

Note: selecting of "Restricted Default Flash Partition" allows overwriting of backup files in the SP3 flash. This option is normally not enabled and a special password would be required.

APPENDIX F: WEB INTERFACE GUIDE continued

3. Setup screen[2].

Setup screen

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 Name[3] are hardcoded and cannot be changed and saved!

---

[2] This page is currently obsolete and will be expanded in the future software revisions to allow complete system configuration.
[3] This is the same as "Net Bios Name" referred elsewhere in the documentation.

4. Status screen.
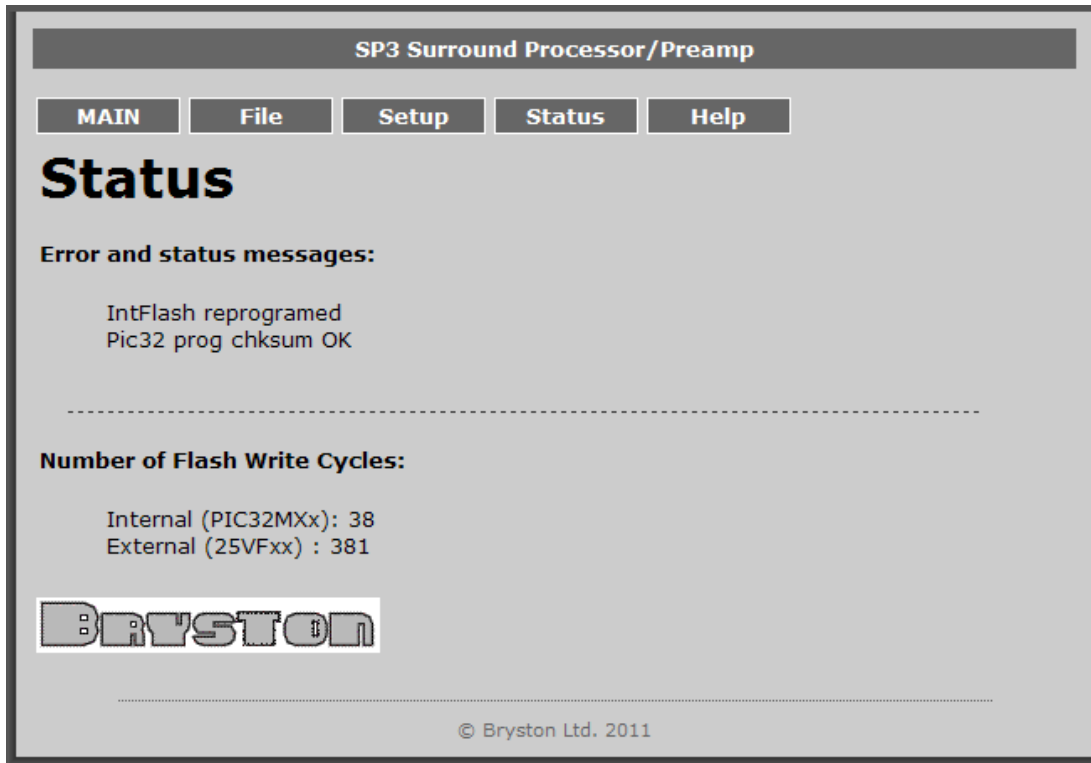
Setup screen (as of firmware version 2012.04)[4]
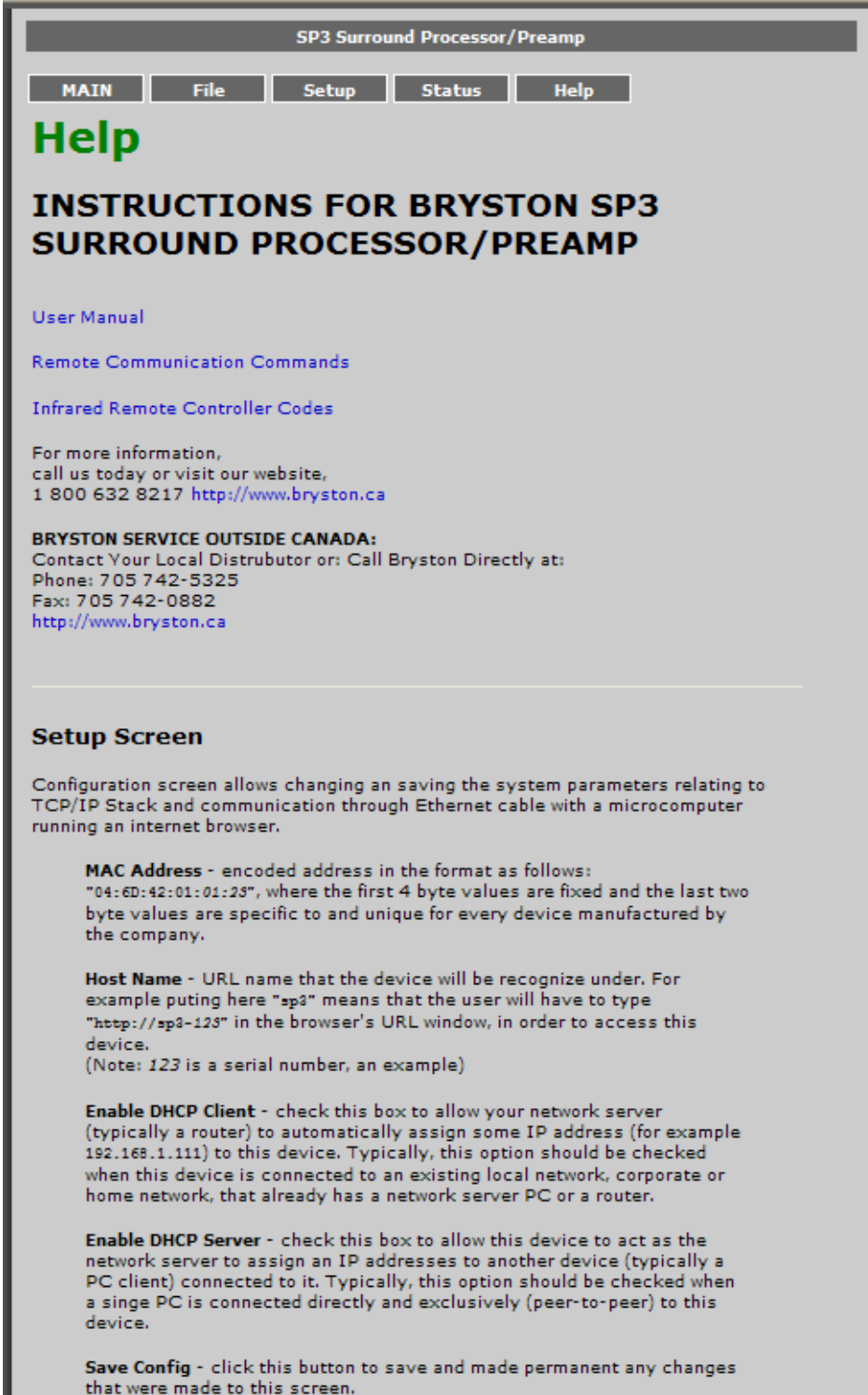
Status screen displays the current "Error and Status messages" (if any), and "Number of Flash Write Cycles"[5].

> Note: the following error **"PWRGD PWR Stat Fail"** or **"Power or fuse failed"** typically comes accompanied by other secondary messages such as "Volume Control Fault", "DSP Fault after Reset", "Invalid Alpha Reply", "DSP Fault" etc. It is most likely caused by a blown fuse. To replace the fuse, locate it in the far left corner inside the unit, after opening up the top cover.

---

[4] 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.

[5] This is an advanced technical information of no relevance, used only for diagnostics and support.

APPENDIX F: WEB INTERFACE GUIDE continued

5. Help 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 to work)

Remote Communication Commands – displays the list of available RS232 commands, such as #10MPWR01 etc.

Infrared Remote Control Codes - displays the list of available IR remote controller codes. The codes can be entered in to BR3 remote controller by pressing "Code" button once (which lights the red LED) and then pressing three numeric buttons[6] in the short succession while the red LED is lit.

> Note: some of the help hyperlinks point to embedded files in the SP3, while some other, such as the user manual, point on-line thus require active internet connection.

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 recomended 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/"

   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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---

[6] 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.

SP3 Subwoofer and Speaker Setup

21-June-2012, Bryston Ltd., Stan Bleszynski
Added footnote 6 on page 3.

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 Fc submenu, separately for the front speakers, center, surround and back. The LFE channel cannot be altered or cut off[1] 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 Large[3], 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).

---

[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 (L_0, R_0). 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".
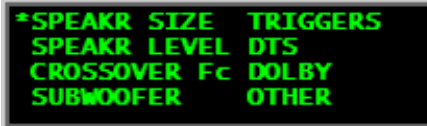
```
*SPEAKR SIZE   TRIGGERS
 SPEAKR LEVEL  DTS
 CROSSOVER Fc  DOLBY
 SUBWOOFER     OTHER
```
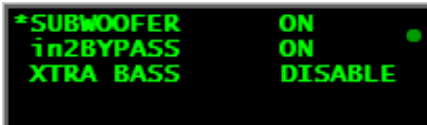Source Setup Screen

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 CROSSOVER[5] and subwoofer configuration is in SUBWOOFER submenu.

```
*SUBWOOFER      ON      ●
 in2BYPASS      ON
 XTRA BASS      DISABLE
```
Subwoofer setup screen (Small speakers)

Subwoofer setup screen differs between the situation when the Front speakers were declared as "Small" (above) versus when the Front were declared "Large" (below):
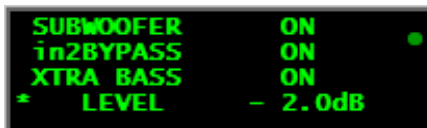
```
 SUBWOOFER      ON      ●
 in2BYPASS      ON
 XTRA BASS      ON
*    LEVEL    – 2.0dB
```
Subwoofer setup screen (Large speakers)

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] 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] Cutoff frequency may need be changed only if the speakers are unusually small with higher bass cutoff than 80Hz, or if they are medium size with lower than 80Hz cutoff but significantly higher than 30Hz (30Hz would be "Large").

4. Xtra Bass feature.[6]

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.[7]

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.

5. Interpretation of the x.1 and x.0 symbols on the SP3 idle screen

"IN:…" line:

Symbol ".1" or ".0" (as in 5.1 in the "IN: DdDigital 48k 5.1" above) indicates a presence or an absence of the LFE channel in the input stream.   This is independent on the SUB selection in the SOURCE SETUP menus.   It reflects the status flags embedded in the digital input stream. The actual flags can be read in hexadecimal format in SYSTEM SETUP-->TESTS-->SYSTEM STATUS: SIGNALFORMAT

"OUT:…" line:

---

[6] **Currently in firmware release 2012.05e, Xtra Bass feature only applies to 2 channel analog, digital and HDMI sources. It is not active for multichannel 5.1 or 7.1 sources, even if enabled., and is not applicable in bypass modes. In the future release this limitation will be lifted.**

[7]   LFE will always be reproduced only though 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.

Symbol ".1" or ".0" (as in the "OUT: PL2xMovie7 EX 7.1" above) indicates a usage or a lack of usage[8] of the Subwoofer speaker and is a function of the output configuration and the presence of the input LFE channel. There are two cases:

a) Front speakers are Small:

>   If you select Subwoofer ON, then you will always see   OUT:… .1 - indicating that the subwoofer is being used.

>   If you select Subwoofer OFF, then you will always see OUT: ... .0 - indicating that the subwoofer is not used (bass contents will be lost).

b) Front speakers Large:

>   If you select Subwoofer ON, XTRA BASS OFF, and if the input stream does not contain LFE channel (IN: .. .0) - then you will see OUT: ... .0 - indicating that the subwoofer is not being used (all bass contents is being reproduced through the front large speakers).

>   If you select Subwoofer ON, XTRA BASS OFF, and if the input stream does contain LFE channel (IN: .. .1) - then you will see OUT: ... .1 - indicating that the subwoofer is used (all bass contents is being reproduced through the front large speakers but LFE goes through the Subwoofer).

>   If you select Subwoofer ON, XTRA BASS ON - then you will see OUT: ... .1 - indicating that the subwoofer is used (all bass contents is reproduced through the front large speakers and the Subwoofer at the same time, while the LFE if present goes through the Subwoofer only.

---

[8] A usage or no usage of the subwoofer channel is not equivalent of stating that the signal is or is not present.   If the subwoofer channel is indicated as being "not used" (.0) then there is no signal but if it is .1 then the presence of a signal depends on the actual input stream contents.

APPENDIX H

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 down[1]. 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 IP[2] .

"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.

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-over[3] 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:

```
*DHCP   STATIC IPadr    ^

IPadr   169.254.1.1
IPmsk   255.255.0.0
```
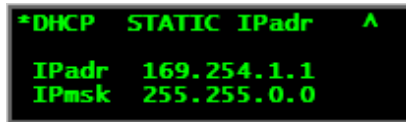
TCP/IP setup screen

Make sure that the setup screen looks on like above screen[4]. 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

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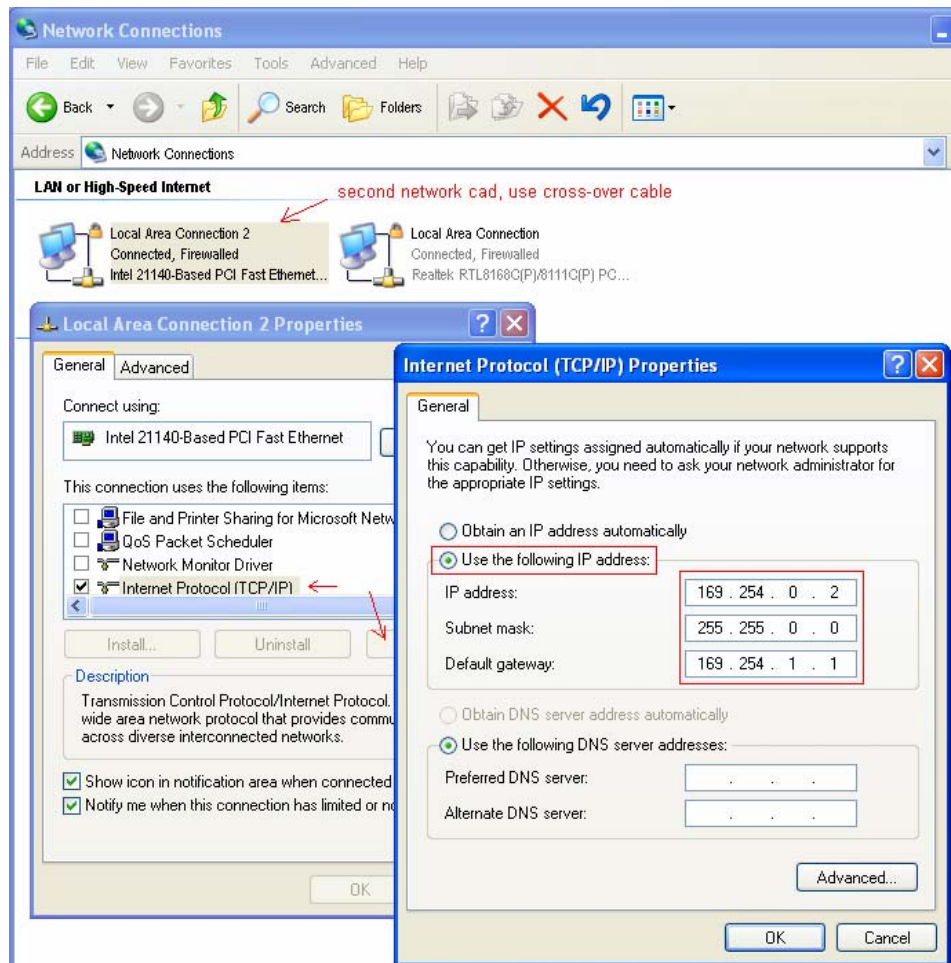
[3] Some network card allow using standard (non-cross-over) Ethernet cables.

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

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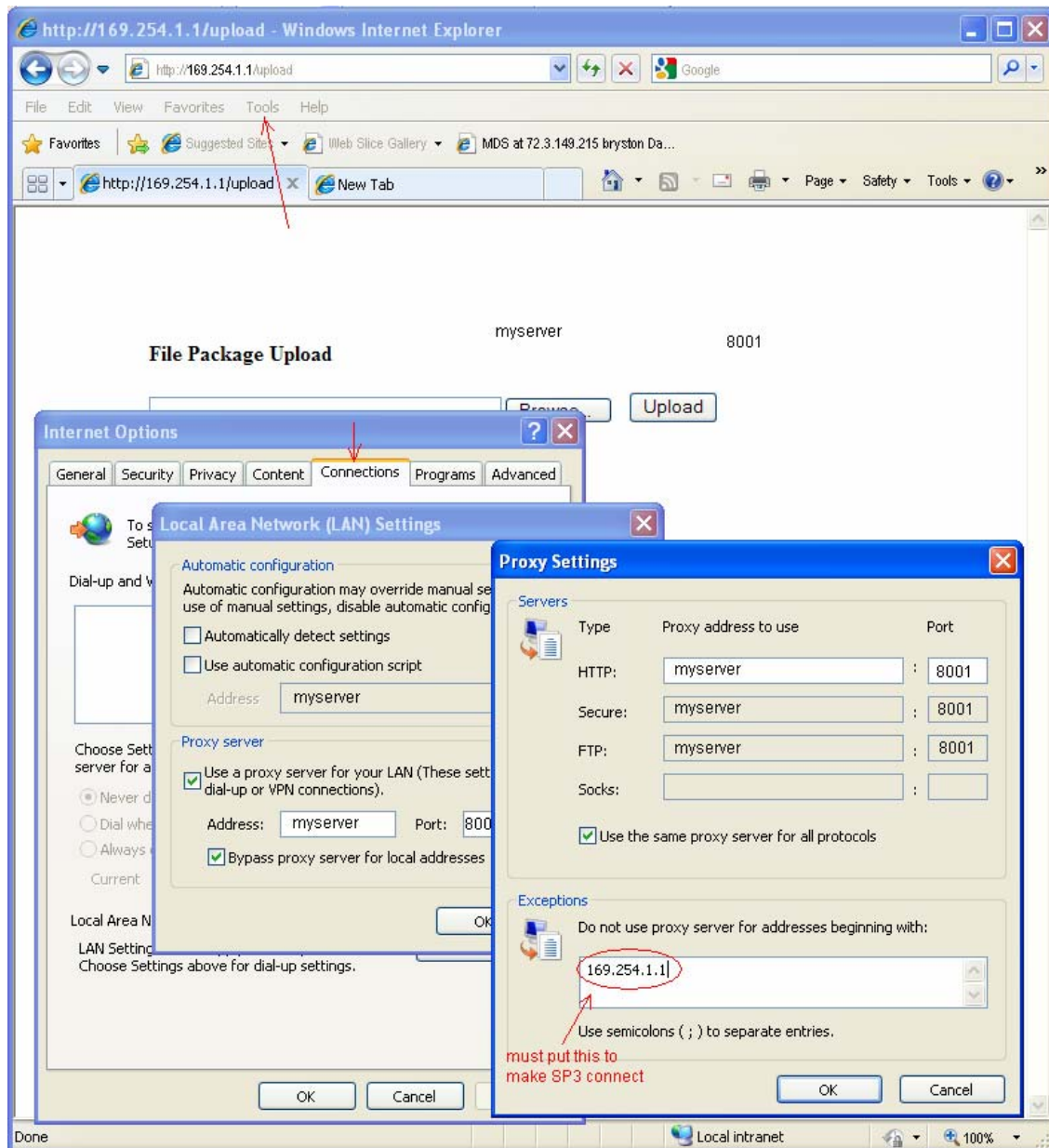
Configuration example of the main network card (LAN) for normal LAN connectivity, allowing for the SP3 static IP scheme.

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
        Default Gateway . . . . . . . . . : 169.254.1.1    ◄── SP3 IP addr

D:\SP3>
```
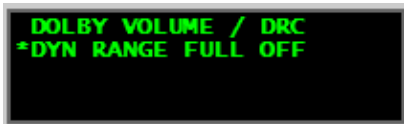
ipconfig/all screen dump

APPENDIX I

DOLBY VOLUME/DRC Screen
2012-08-02
Stan Bleszynski, Bryston Ltd.

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 OFF[2] -   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.

---

[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

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.

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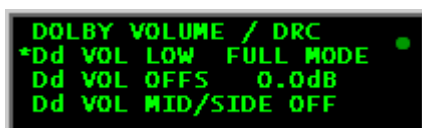
DYN RANGE MEDIUM 1 [3] – Dolby Volume is OFF but older DRC algorithm (Dynamic Range Compression) is ON resulting in medium dynamic range (moderate compression)

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

---

[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

recording (as it should have been listened to originally, in a studio etc). For example, when listening to a movie, this value could be increased[5] 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 continously 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.

> Note: 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.

---

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

Instructions for uploading the SP3 software.
4-Jan-2013

1. You must have the SP3 connected via Ethernet cable to your local area network and powered up, or connected directly to your laptop or PC with a network cable. Make sure that a green light at the SP3 network socket (back panel) is lit. If not then use a cross-over cable or verify that the network interface to which SP3 is connected, is enabled.

2. Open a Browser on your computer (Explorer/Chrome/Safari etc)

3. Type:

>   *http://sp3-serialnumber/upload*

   or

>   *http://xx.xx.xx.xx/upload*

   where xx.xx.xx.xx is the actual IP address of the SP3

4. Optional - if the *sp3-serialnumber* method does not work then use the actual IP address as above, for example:
   http://169.254.1.1

The serial number of the SP3 as well as the actually used IP address (for example 169.254.1.1) are available to view 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
after pressing ← arrow key

SP3 display showing serial#, firmware rev# and ActIP

IP address shown in Miscellaneous sub menu
("ActIP" stands for "Actual IP address")

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

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

File Package Upload
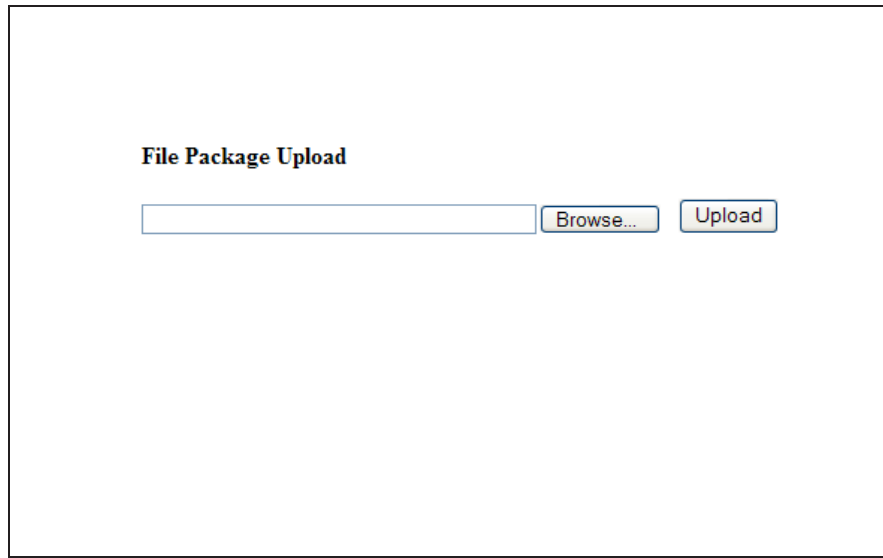
[Browse...] [Upload]

"File Package Upload" page of the SP3.

6. Click on "Browse" button to select the file, and type the path and name of the firmware file (case-sensitive). For example:
　　ftp://bryston.com/pub/firmware/sp3/current/SP3.bin

or, pick the same file from a local directory in your PC, providing that it has already been copied there, for example:
　　c:/tmp/SP3.bin

The file name should appear in the "File name" line as below, then click "Open" or press Enter. to accept selection.

Choose File to Upload

Look in: Tmp

My Recent Documents
Desktop
My Documents
My Computer
My Network Places

File name: ftp://bryston.com/pub/firmware/sp3/current/SP3.bin   [Open]
Files of type: All Files (*.*)   [Cancel]
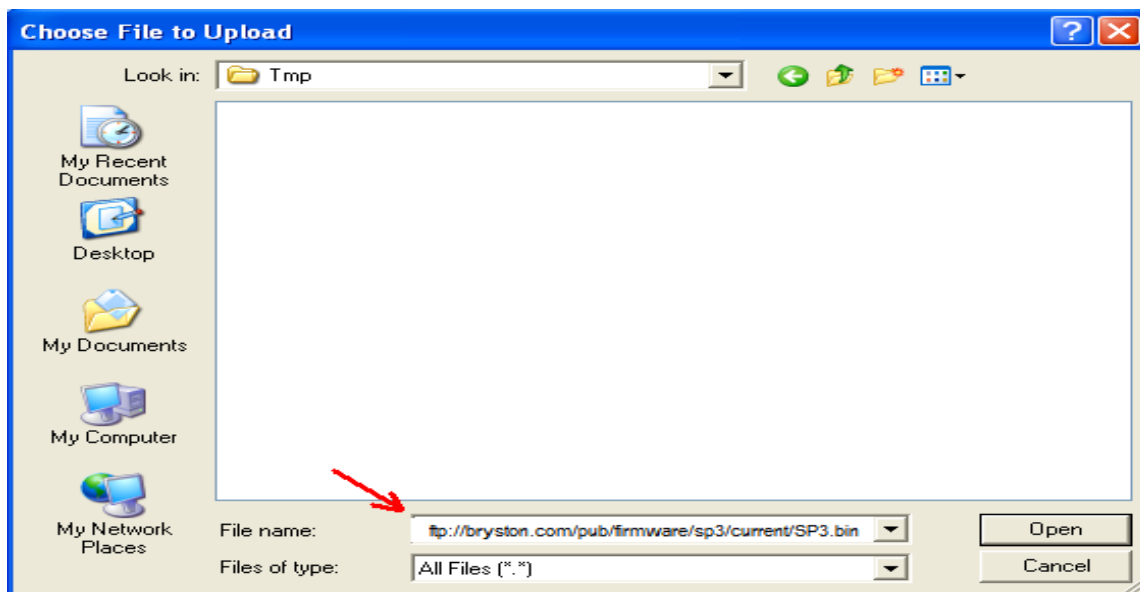
"Choose File to Upload" window (will close when Open is clicked)

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

File Package Upload

| | Browse... | Upload |
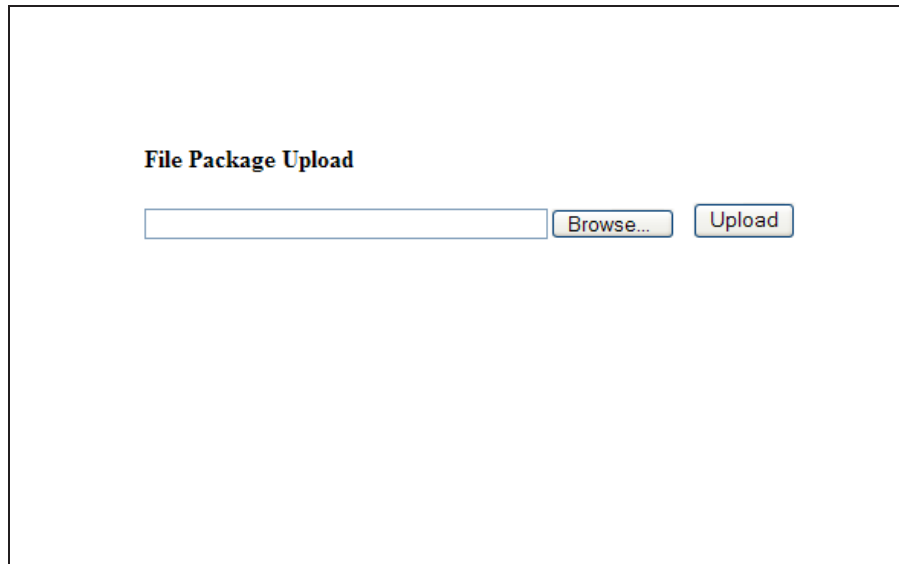
"File Package Upload" page of the SP3.

> Note: If the internet connectivity is not available, then a "file not found" or other error will be shown and the process will be terminated. In such a case a local SP3.bin file must be selected. The file can be obtained by post or email from Bryston technical support and copied into a local directory.

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

> Some browsers[1] might not indicate the upload progress count, however, the Standby LED in SP3 will be blinking and the display on the SP3 will indicate the upload count status.

Wait[2] until the file gets uploaded to SP3 and until the self-programming process is completed.[3] SP3 will automatically load, self-program and re-power up after the programming is finished.

Software update process consists consists of 3 cycles:

---

[1] Chrome browser does indicate the file upload count in %, in the status line at the bottom of the window.
[2] Tpically about one to two minutes.   Ignore error messages that may appear in the browser window during programming stage, due to time-out.
[3] 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!

APPENDIX J: FIRMWARE UPLOAD INSTRUCTIONS continued

a)   SP3.bin file uploading (about 1minute).   During this stage the FIRMWARE UPLOAD screen is displayed showing the progress count in seconds, bytes remaining to be transferred and status. The unit will only respond to a limited number of commands and buttons, namely: Left Arrow and Standby button to cancel the process. When the process is cancelled at this stage, it returns to the main screen and the unit can operate as the audio processor as before with the exception of web controls. Cancelling of a pending upload may leave some internal web source files missing, preventing the main SP3 web control page to work. In such a case the only web interface part that is guaranteed to work is the upload page: http://sp3-xxx/upload   (or http://xx.xx.xx.xx/upload).   To restore the web page the upload process should be restarted and allowed to finish.

b)   Internal self-programming cycle (about 1 minute). The screen and all LEDs except standby are blank and the SP3 unit undergoes internal self-programming cycle of its control processor using the newly uploaded SP3.bin firmware file. This stage cannot be interrupted! The progress of the self-programming can be followed observing the standby LED blinking pattern.   In the first (file verification) stage the LED blinks in short pulses interspaced by long (few sec) gaps, in the second stage (self-erase) it goes yellow or magenta for a couple of seconds, in the third stage (self-program) it stays green or blue for about 10 seconds.

> **If the original firmware is older than 2012.05e and SP3 unit is unpowered during the internal self-programming cycle, while the LED is yellow(pink) or green (blue), then it may be rendered in-operable, requiring a factory reprogramming service[4].**

c)   Reboot and "idle test" of the newly programmed software (20s). The unit shows a standard power up logo screen, then the main screen. The first 10 seconds following the boot is the so-called "idle test" marked with the Standby LED staying on (yellow or magenta). If the unit crashes or is accidentally powered off during this time, then the system will reprogram itself yet again on the next power up, restoring the factory backup software (factory backup release number is prefixed with 'f', for example f2012.05).

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 to a new value.

8. Comments regarding the 2012.11 or later firmware upgrade and re-defaulting of system parameters.

---

[4] Applies only to bootloader version 2011.32 and earlier. Bootloader version number can be viewed in SYSTEM SETUP-->TESTS-->SYSTEM STATUS screen. More recent bootloader versions from 2012.05 onwards are able to recover from accidental power off at any stage.

Firmware revision 2012.11 and later do not automatically redefault internal configuration parameters and setups, therefore upgrading from a firmware earlier than 2012.05e may cause software errors after power up, if a parameter introduced in the latest revision did not exist in the old revision being replaced.   If that happens upgrade first to revision 2012.05e (ftp://bryston.com/pub/firmware/sp3/2012.05e/SP3.bin) which will reset all parameters, and then upgrade to the latest firmware.

If the upload followed by self-programming fails for whatever reason[5], then the system reverts to factory default which has a suffix 'f', that is in this case the firmware revision reads as f2012.05e (or earlier) but functionally it is identical to the firmware with 'u' prefix.   If the bootloader reverted the firmware to a factory backup, it is recommended to upload the new firmware file again and to watch the sequence of events. The upload should last about 1 minute, followed by a reboot (all automatic, it is not necessary to press anything).   Then the screen will remain dark for another minute or so, while the standby LED begins flashing a multicolor codes - first a few short blink codes, followed by about 1 second long yellow or magenta (erase stage) followed by a few seconds of long red (self-programming stage).   Then the system will attempt an automatic restart, the screen will show the boot logo picture, then the new firmware revision number and then the normal idle screen will show up. However, the standby LED will remain lit yellow or magenta for another 10 seconds while executing an automatic self check. During that time it may optionally, automatically reprogram the keypad processor - do not power off at this stage!   If the new software crashes during the time when the standby LED was lit, or if the processor gets unplugged or if another upload is started from the ethernet link by accidentally restarting the upload sequence (for example, pressing browser "Reload/Refresh" button), the self check may fail which will force the bootloader to reload the factory backup firmware on the next power up.

Firmware 2012.11 or later, do not automatically redefault the system configuration parameters (in EEPROM memory) like the previous updates.   This may potentially cause a startup failure if some newly introduced parameters are not initialized, it also depends on the old configuration status.   This should not happen when upgrading from 05e but may happen with some older revisions prior to 05e.   In such a case it is recommended to upgrade first to revision 05e. Use:
    ftp://bryston.com/pub/firmware/sp3/2012.05e/SP3.bin

The first time 2012.11 boots after upgrading from 05e, it will display a message on screen:

```
EEPROM is incorrect!
Run MISCELLANEOUS->
     DEFAULT EEPROM
```

---

[5] Most frequent cause are: an incomplete file transfer due to network errors, breaking browser connection by accidentally exiting it in the middle of a transfer, inadvertently refreshing browser upload page in the middle of a transfer or immediately after the first new boot-up when the standby LED is still lit, or accidental power down.

APPENDIX J: FIRMWARE UPLOAD INSTRUCTIONS continued

It is recommended to follow it, that is go to Miscellaneous menu, and scroll down to DEFAULT EEPROM option[6], press Surround arrow key to select "DO IT" and execute the action by exiting the screen, pressing left arrow. Alternatively, the user has a choice to navigate to the configuration menus in order to write down (or memorize) the pre-existing configuration, so that the old settings can be manually re-inserted after the re-default.

A fresh 2012.11 upgrade may results in some EEPROM related error messages to be displayed in the SYSTEM SETUP-->TESTS-->SYSTEM STATUS screen, which should clear after executing DEFAULT EEPROM and re-powering (re-plugging)[7] the unit. It is recommended not to use revision 2012.11.

Firmware revisions 2012.12 and later, have restored the automatic EEPROM redefault following an upgrade, due to frequently encountered problems involving uninitialized or mis-initialized parameters.

It is strongly recommended to use the latest firmware revision!

Stan Bleszynski
Bryston Ltd.

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[6] The hidden menu screens will be already automatically unlocked, so no need to press Zone,DVD,Tape!
[7] Standby will not clear it! Alternatively, error messages can be manually cleared by pressing the right arrow on the error screen, or cleared from the TCP/IP or RS232 terminal by issuing .c command.

SP3 control through RS232 and TCP/IP

Updated 2-Aug-2012

1. Bryston Serial Protocol command set for SP3.

SP3 receives control commands and responds back to the host controller following an execution of each command. SP3 can also be configured[1] to automatically broadcast automatic responses through RS232 or TCP/IP upon certain system events such as input source switching or volume level setting from the front panel or by IR remote controller. The following commands can be sent over RS232, RS485 (with a RS232/RS485 interface) and TCP/IP (using GET mechanism over port 80).

Command format[2]:
ASCII strings ended with carriage return (code 13) or dot (.).
#D1D2C1C2C3C4P1P2...<CR>

#	command start character (RS232 only, in TCP/IP use URL code %23 instead)
D1	device category, one digit 1..f (for SP3 D1 must be 1)
D2	RS485 device ID, 1 digit 0..f(dflt=0). D2=0 typically and can only be changed through the front panel menu!
C1..C4 command name (4 chars) , typically uppercase ASCII letters.	
P1,P2 parameters are two or more arbitrary ASCII characters.	
<CR> Special end char, ASCII code 13 (RS232 only, in TCP/IP use dot '.' instead)	

RESPONSE FORMAT
The Response format is the same as commands, repeating the D1,D2,C and P bytes (P bytes may carry either an actual status value or ?? in case of errors).

Example (TCP/IP):

%2310MPWR01.   - command: power up

---

[1] MISCELLANEOUS→RS232 MODE=ON+AUTOFB, note that this option resides in a hidden screen. To unlock the hidden screens got to the last miscellaneous screen and then press ZONE,DVD and TAPE buttons, in this order

[2] SP3 may have additional unsupported commands that are exceptions to Bryston Serial Protocol, for example a common help displaying command is a single question mark character **?** or some test and diagnostic commands that are implemented for the purpose of trouble-shooting. The special commands should never be used by controllers and in automated remote control scripts since they are not guaranteed to be supported in all future product revisions!

Examples (RS232):

#10MPWRQS<CR> command: query power status

#10MPWR00<CR> response: power is off (in standby)

#10MPWR01<CR> command: power up

#10MPWR01<CR> response(delayed): power is on

All characters preceding the # of a command, and following the <CR> will be ignored. Do not insert #, spaces, <LF>, <TAB> or other non-ASCII characters inside the command string.

When using TCP/IP, replace carriage return character with the dot '.' character (except in the SP3 virtual front panel), and replace hash # with the URL encoding of %23 .

Do not assume that the number of response bytes R1,R2,… is always fixed. Allow up to 320 bytes to be read or until a <CR> is encountered.

The format of the automatic responses is the same as the response to a serial command sent with the parameter bytes P1 P2 = "QS".

All commands except MPWR and INFO are ignored and not responded to when SP3 is in Power Standby state.

SP3 Bryston Serial Protocol commands can be found in an embedded help files:
   http://sp3-<ser.num>/helpcmd.txt [3]
or
   http://sp3-<ser.num>/helpcmd.htm
or, in an on-line Bryston application notes folder:
    ftp://bryston.com/pub/firmware/sp3/doc/

The current list of commands can also be displayed in an RS232 program terminal window, on a host PC connected to SP3 serial port[4], by issuing a single-character special question mark command *?* :

---

[3] If you use a network connection ithout a server or router, type in the actual IP address instead of the "sp3-<ser.num>"

[4] Default baud rate is 9600bps, 1 start bit, 8 bits, no parity, 1 stop bit.   A baud rate and a feedback selection can be set by MISCELLANEOUS→RS232 BAUD and RS232 MODE parameters.   Typing a ? is a convenient way of testing the connection.
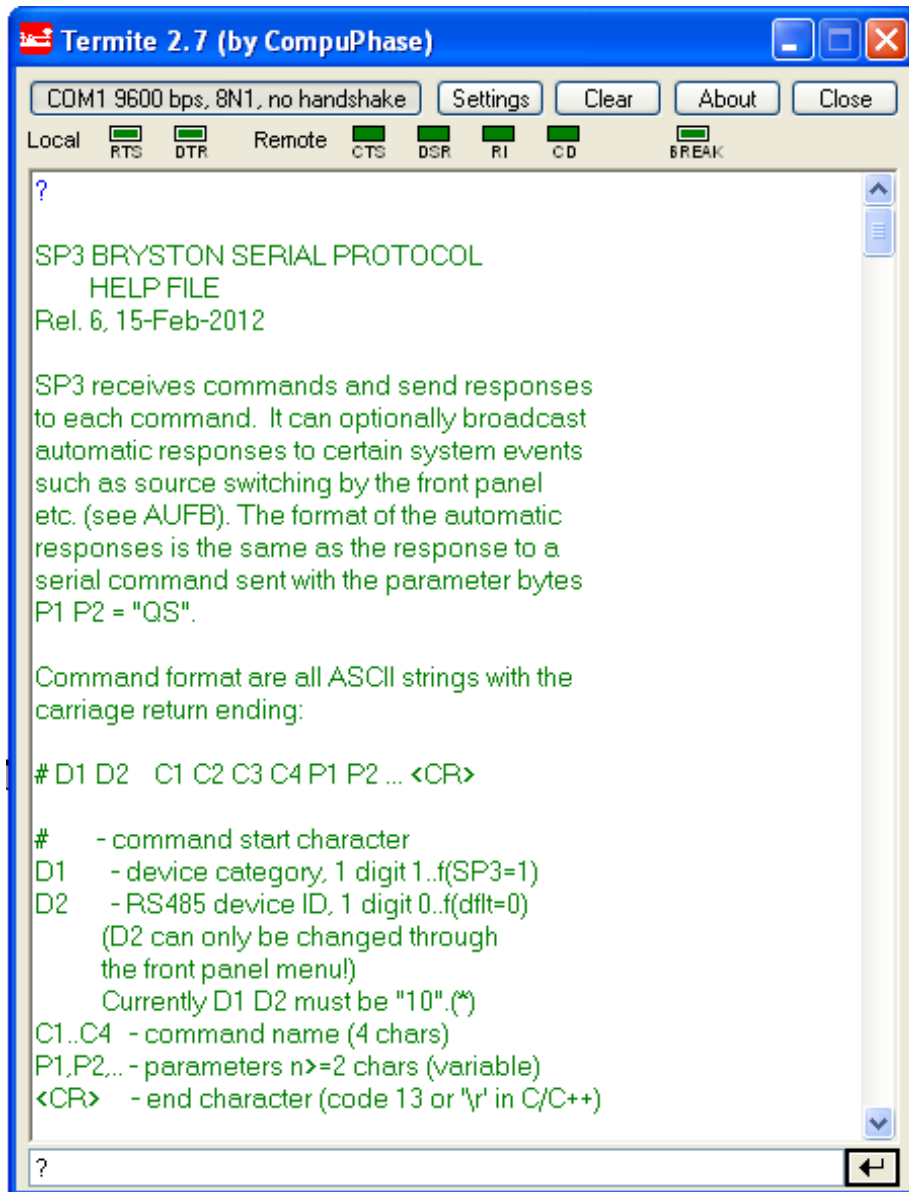
Termite example of issuing the ? command.

The same question mark command (or any other SP3 command[5]) can also be issued by typing the ? character in the command window on the main SP3 web page and pressing Enter (or clicking the Cmd button) to execute. This will make a scrollable text window expand displaying the embedded help page.

APPENDIX K: SP3 CONTROL VIA RS232 & TCPIP   continued
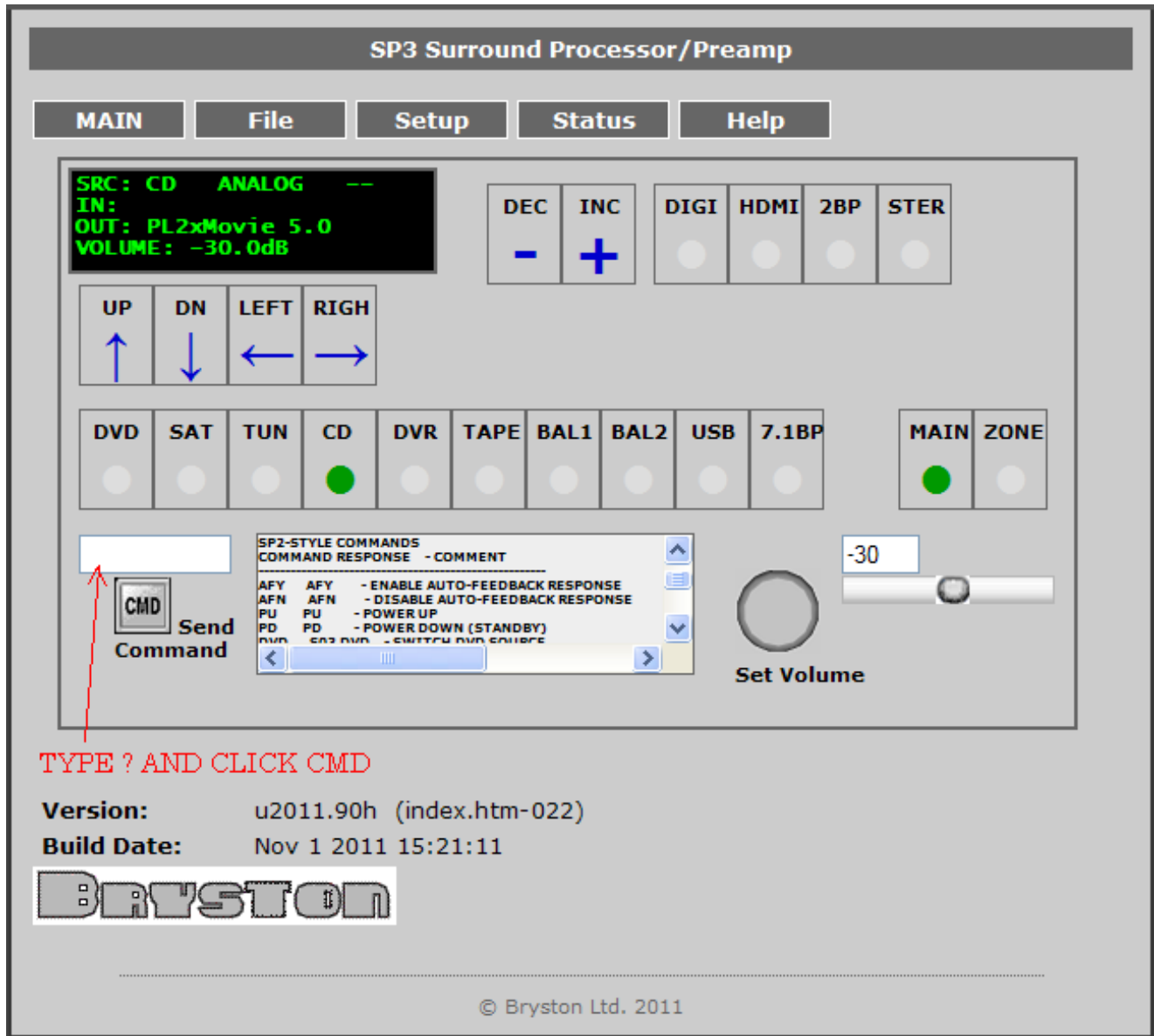
SP3 virtual front panel main web page (http://sp3-<ser.num.>)

Ending of a command by a dot character is not necessary when typing it in the SP3 web interface window, but mandatory when issuing the GET command programmatically or from a browser's URL window. Pressing a carriage return key while the SP3 web page is in-focus is equivalent of clicking on Cmd button icon.

2. Communication through RS232 port.

All commands described in the helpcmd.txt or helpcmd.htm file can be sent through the serial port, receiving the response of up to 320 characters.   It is recommended to test the RS232 communication link using a PC running a serial terminal program, before connecting to a dedicated controller box.   An instruction on how to connect the serial port on SP3 and a list of some commonly available third party freeware or shareware terminal programs is in this document:

ftp://bryston.com/pub/firmware/sp3/doc/SP3_RS232_Notes....pdf

3. Communication through Ethernet port. TCP/IP HTTP-GET

a) Sending a command through URL and a browser.

Before testing this method, bring the SP3 virtual panel web page on screen to make sure that the LAN connection is established. For example, type in an actual IP address[6] of the SP3:   http://169.254.1.1

Next, send an HTTP GET command directly, from a URL window of a browser or from within a web-aware application supporting HTTP protocol. For example [7]:
   http://169.254.1.1/cmd.cgi?cmd=%2310MPWR01.
   http://169.254.1.1/cmd.cgi?cmd=%2310MSRCQS.

> Note: the hash character # must be replaced by the equivalent URL encoding of   %23 .   The dot character at the end of the lines above is significant and acts as the end-of-command terminator replacing the <CR>.

Above sequences passes commands from the host to SP3. In order to pass data in the reverse direction, from the SP3 to host, type the following text into the URL window and press Enter[8]:   http://169.254.1.1/status.xml
This will cause the SP3 system status data to be read from the SP3, including a response from the previously sent control command (in this case MSRCQS), to appear in the main browser window, for example:

---

[6] The actual IP address can be viewed on the serial number screen displayed by pressing the left arrow navigation key on the front panel or IR remote.

[7] For the power up command to work over TCP/IP out of the standby state, Ethernet interface must be enabled using Miscellaneous→ETHERNET IN STBY: ON setup. Default is OFF.   To access that parameter setup scroll down Miscellaneous menus then unlock the hidden screens pressing ZONE, DVD and TAPE buttons in this order, or issue code 222 on the BR3 infrared remote. Only RS232 is always enabled by default and works in standby state, although only MPWR and INFO commands are supported in standby.

[8] The "Enter" key works only on desktop operating systems such as Windows7, MacOS etc. On tablets running Android, iOS etc, one must tap CMD icon instead, in order to send a command.

APPENDIX K: SP3 CONTROL VIA RS232 & TCPIP   continued

Reading system status
after sending
#10MSRCQS command

```
169.254 ×    169.254 ×

← → C   169.254.1.1/status.xm ☆ 🔧
  Suggested Sites        »   Other bookmarks

This XML file does not appear to have any style
information associated with it. The document tree
is shown below.

▼<response>
    <led0>2</led0>
    <led1>2</led1>              ←——————— DVD LED
    <led2>0</led2>
    <led3>0</led3>
    <led4>0</led4>
    <led5>0</led5>
    <led6>0</led6>
    <led7>0</led7>
    <led8>0</led8>
    <led9>0</led9>
    <led10>0</led10>
    <led11>2</led11>            ←——————— MAIN LED
    <led12>0</led12>
    <led13>0</led13>
    <led14>0</led14>
    <led15>2</led15>           ←——————— HDMI LED
    <led16>0</led16>
    <led17>0</led17>
    <pot0>90</pot0>
    <vol0>90</vol0>            ←——————— Volume level
    <txt0>SRC: DVD HDMI1</txt0>  ⎫
    <txt1>IN: DdDigital 48k 2/0</txt1>  ⎬ 4 display lines
    <txt2>OUT: Neo6Music 7.1</txt2>  ⎪
    <txt3>VOLUME: -60.0dB</txt3>  ⎭
    <twflg0>3</twflg0>
    <tw0>#10MSRC00</tw0>        ←——————— command response
    <tw1>.null.</tw1>
    <tw2>.null.</tw2>
    <tw3>.null.</tw3>
    <tw4>.null.</tw4>
    <tw5>.null.</tw5>
    <tw6>.null.</tw6>
    <tw7>.null.</tw7>
</response>
```

SP3 system status and command (MSRCQS) response polled and passed
through status.xml data block.

Note: SP3 response to a Bryston serial Protocol command is contained
within the tags: <tw0>..<tw0>   to   <tw7>..<tw7>

b) Sending an HTTP GET command through Telnet terminal window.
First start Telnet service by:
>**telnet IP 80**
Where 80 is the port number (always use port 80) and IP is the actual IP address of the
SP3 unit, for example 169.254.1.1. Next, send the following packet (for example type it
into a Telnet terminal window):
GET /cmd.cgi?cmd=%2310MSRC05. HTTP/1.0
or send the same packet as above directly from a Telnet-like application program using
Telnet GET command protocol to port 80.
Above sequence passes a command (in this case selection of input source "MSRC")
from a host to SP3.   In order to pass data (i.e. command response) in the reverse
direction, from the SP3 to the host, type the following into the Telnet terminal window
and press enter: GET /status.xml HTTP/1.0
This will cause the incoming data read from the SP3 appear underneath, for example:

Using GET status.xml to read system status and command response from SP3.
The response is contained within the tags: <tw0>..<tw0>   to   <tw7>..<tw7> .

Stan Bleszynski, Bryston Ltd.

APPENDIX L

SP3 Pink Noise Test
5-March-2012, Bryston Ltd., Stan Bleszynski

1. Introduction.

Pink[1] Noise Test features allows adjusting and correcting relative speaker efficiencies by playing the noise sound of known and constant intensity through each speaker channel, while recording the sound pressure with a sound pressure meter[2].

2. Starting the Pink Noise test from the Front panel:

Go to SYSTEM SETUP-->TESTS-->PINK NOISE

```
PINK NOISE: AUTOCYCLE
PRESS:    ⇐ TO EXIT
SPEAKER:     L
SETVOL:-17.5dB
```

If you press right arrow again it will go into the "Pink Noise" screen (see above) and will start playing the noise in the AUTOCYCLE mode, that is it will go through all the enabled speaker channels[3] for a few seconds each, repeating ad infiniti. To exit press the left arrow or power/standby button.   Bottom line label "SETVOL:" indicates that it is possible to adjust the global volume level (-80dB to +12dB) with the volume knob – that is the case only when the Left Front speaker channel is playing!
 Adjusting volume level while other than the L channels is playing, only changes the specific Speaker Level offset within -12dB to +12dB range (as in SOURCE SETUP-->SPEAKR LEVEL screen) rather than the global volume!   This situation is shown on the screen below where the bottom line label changed to "SPK LEVEL:"

```
PINK NOISE: AUTOCYCLE
PRESS:    ⇐ TO EXIT
SPEAKER:     R
SPK LEVEL:      0.0dB
```

---

[1] The term "pink noise" as opposed to "white noise", refers to the spectral characteristics of the sound, where the spectral power density is higher for lower frequencies, or more specifically each octave carries an equal amount of power (see http://en.wikipedia.org/Pink_noise).
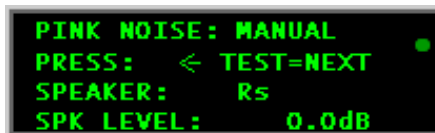[2] Sound pressure meter is an external accessory not included with the SP3.
[3] If all speakers are enabled then it will go through L,C,R,Rs,Rb,Lb,Ls and Subwoofer (subscript s means "side surround", b – "back surround").   Disabled speakers - those configured as "None" in the SOURCE SETUP→SPEAKER SIZE, are skipped.

Note: instead of adjusting volumes while playing noise and reading the sound pressure at the same time, it is probably easier to write down the sound pressure readings for each speaker channel and then adjust the corresponding speaker levels in the SOURCE SETUP-->SPEAKR LEVEL submenu.   After adjustment, it is recommended to verify it by rerunning the noise and retesting the sound pressure levels.

3. Starting by TEST button on the infrared remote controller.

SP3 goes to the "Pink Noise" screen and starts playing the noise in the AUTOCYCLE mode, the same as when selecting it by the front panel through TEST submenu, except that it will exit automatically after the last speaker channel in the sequence (typically subwoofer) finished playing.

If one presses TEST button again while any of the channel is playing noise in AUTOCYCLE mode, the AUTOCYCLE mode changes to MANUAL mode (see below). Once in the MANUAL mode, pressing TEST button each time increments the speaker channel through the entire sequence of enabled channels (L,C,R,Rs,Rb,Lb,Ls and SUB, skipping disabled channels).

```
PINK NOISE: MANUAL
PRESS:    ⇐ TEST=NEXT   ●
SPEAKER:     Rs
SPK LEVEL:     0.0dB
```

Global volume level (-80 to +12dB) can be adjusted when the first channel (L) is played, while the individual speaker levels (-12 to +12dB) can be adjusted while the other channels are playing. The test ends when the last channel in the sequence has played or when the left arrow key is pressed (or POWER is toggled) .
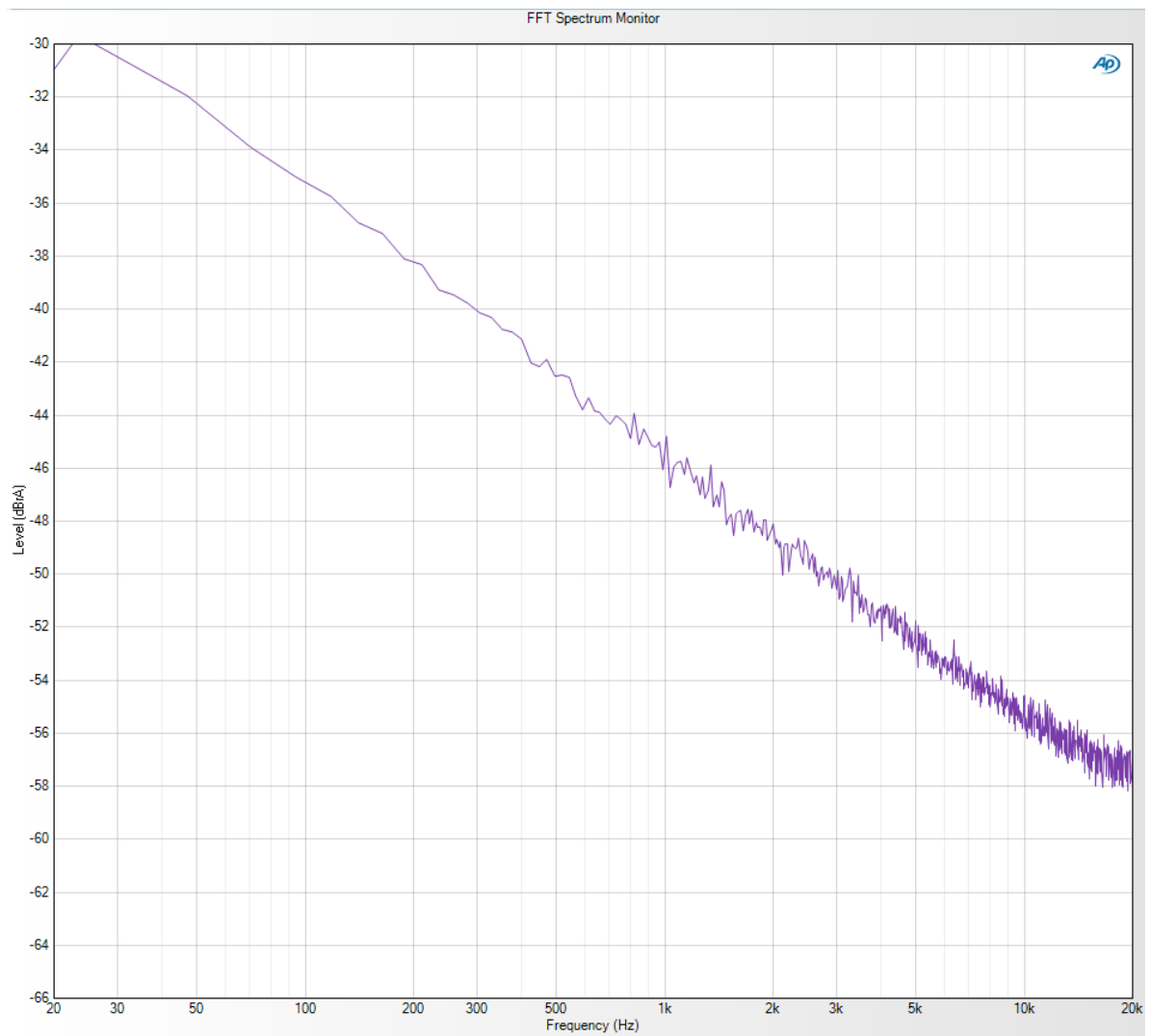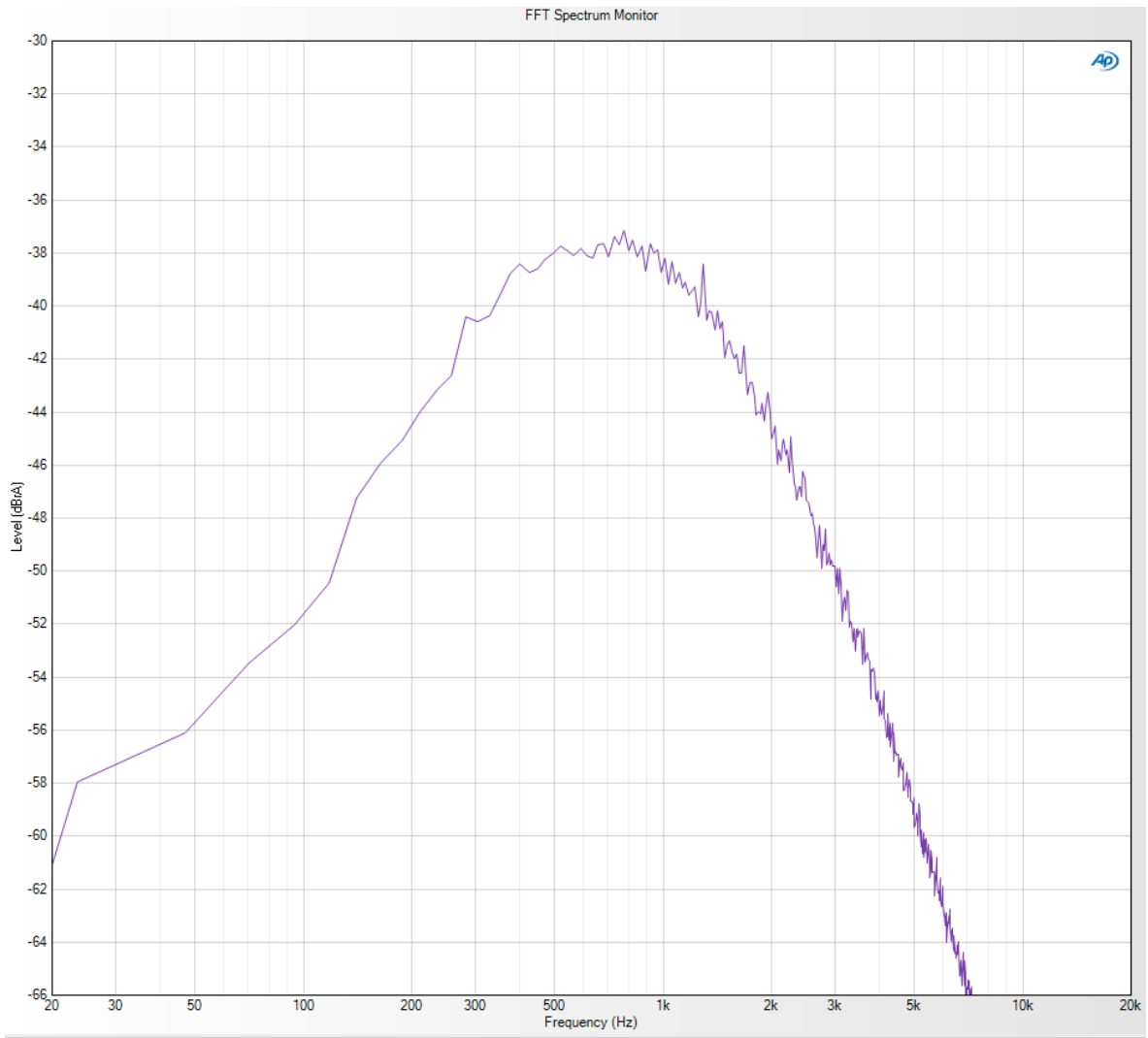
4. Pink Noise spectrum

Fig. 4.1 Pink Noise spectrum
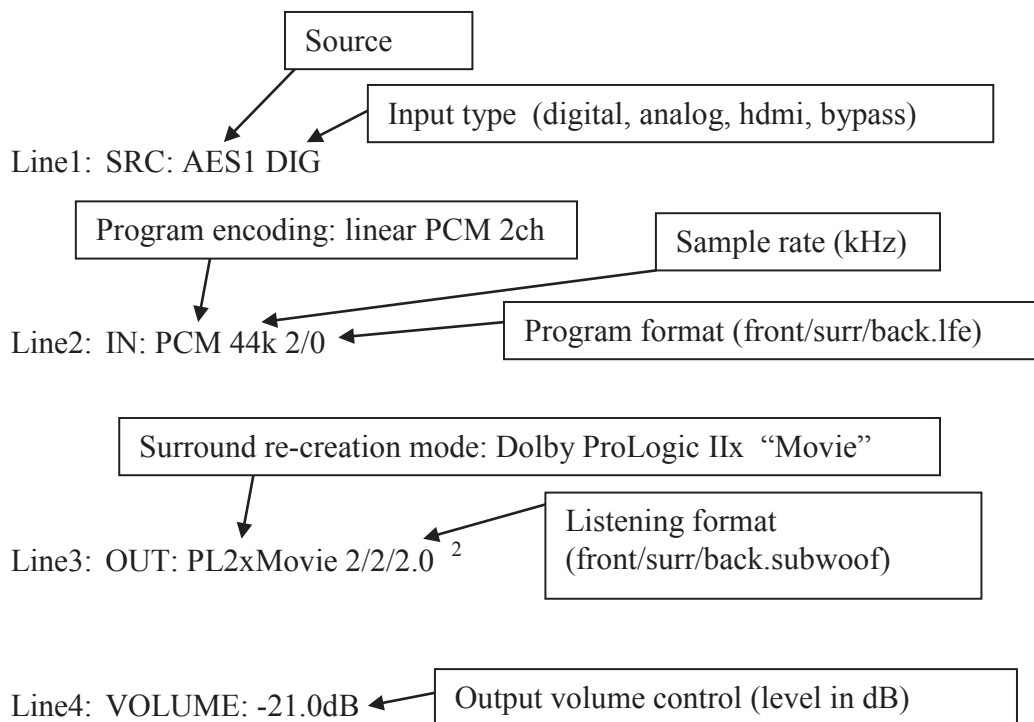

5. Band-limited noise spectrum.

APPENDIX M

SP3 IDLE SCREEN EXPLANATIONS
2011-11-24

SP3 DEFAULT SCREEN

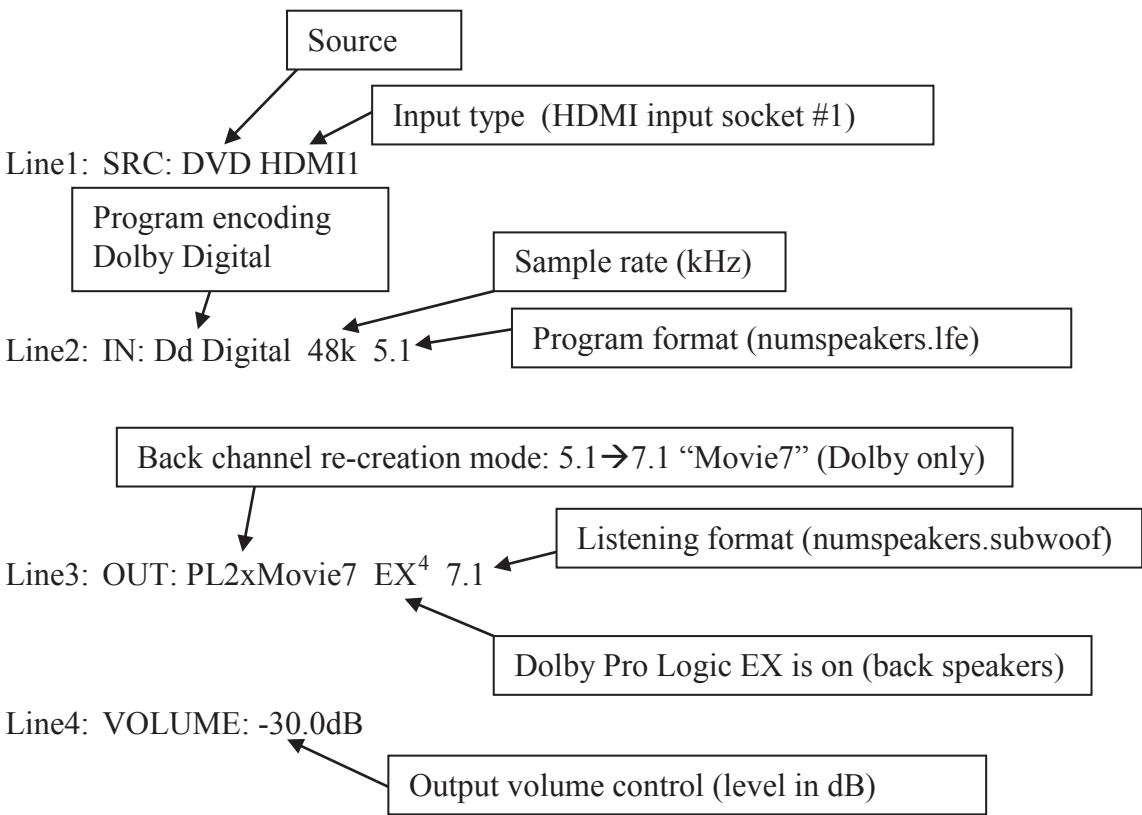**1. Default screen, playing SPDIF input, PCM-encoded 2 channel stream, example 1[1]:**

```
SRC: AES1  DIG
IN:  PCM 44k 2/0.0
OUT: PL2xMovie 2/2/2.0
VOLUME: -21.0dB
```

Source

Input type (digital, analog, hdmi, bypass)

Line1: SRC: AES1 DIG

Program encoding: linear PCM 2ch

Sample rate (kHz)

Program format (front/surr/back.lfe)

Line2: IN: PCM 44k 2/0

Surround re-creation mode: Dolby ProLogic IIx "Movie"

Listening format (front/surr/back.subwoof)

Line3: OUT: PL2xMovie 2/2/2.0 [2]

Line4: VOLUME: -21.0dB

Output volume control (level in dB)

---

[1] Using SPDIF balanced digital source BAL1+DIGITAL, playing two channel audio file from BDP-1

[2] The center speaker was configured as NONE and the rest were declared as LARGE. The ".0" ending indicates that the subwoofer is not being used (in spite being declared as present), since the bass is reproduced through the large front speakers.   If all speakers including center were present, then the short 7.0 would have been displayed instead of the full 3/2/2.0 in such a case. If the front speakers were declared as SMALL then the bass would have been reproduced through the subwoofer and 2/2/2.1 would have been shown instead of 2/2/2.0

2. Default screen, playing HDMI input, Dolby Digital encoded multi-channel stream, example 2[3] :

```
SRC: DVD   HDMI1
IN:  DdDigital 48k 5.1     ●
OUT: PL2xMovie7 EX 7.1
VOLUME: -30.0dB
```

Source

Input type (HDMI input socket #1)

Line1: SRC: DVD HDMI1

Program encoding
Dolby Digital

Sample rate (kHz)

Program format (numspeakers.lfe)

Line2: IN: Dd Digital 48k 5.1

Back channel re-creation mode: 5.1→7.1 "Movie7" (Dolby only)

Listening format (numspeakers.subwoof)

Line3: OUT: PL2xMovie7 EX[4] 7.1

Dolby Pro Logic EX is on (back speakers)

Line4: VOLUME: -30.0dB
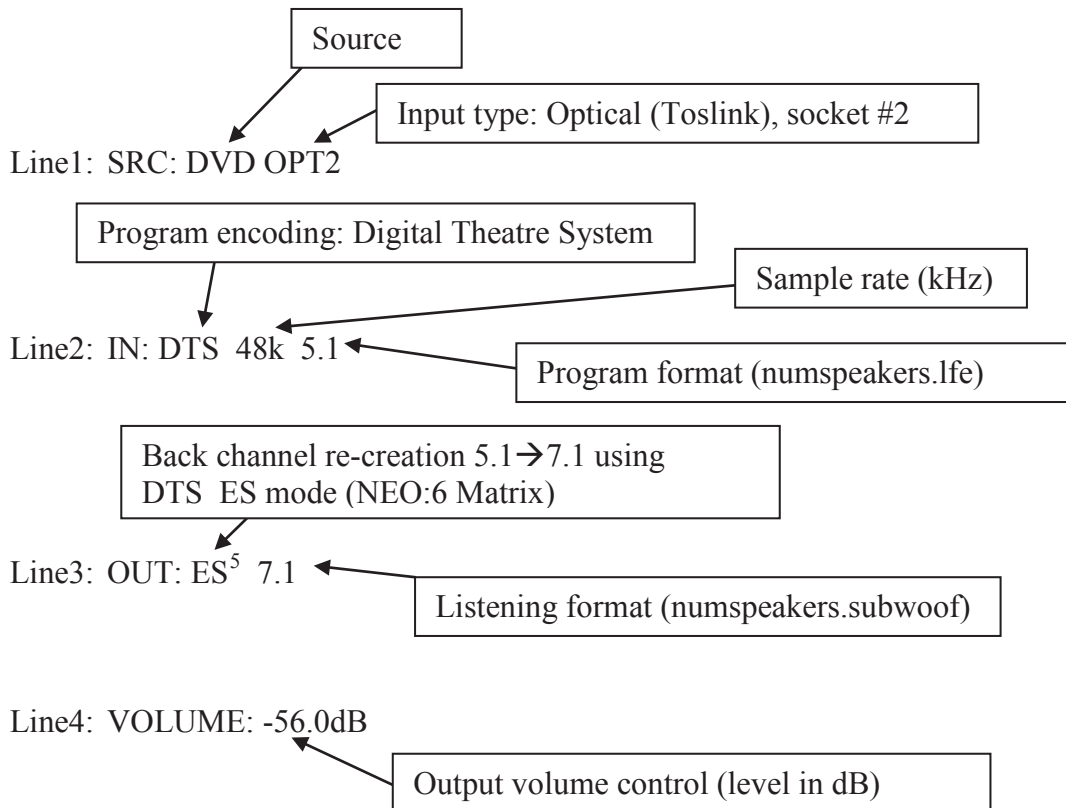
Output volume control (level in dB)

---

[3] Playing multichannel (5.1) source from DVD disk, through HDMI. Listening setup consists of 8 speakers (2 front, 2 surround, 2 back and 1 subwoofer).

[4] Indicates Dolby Pro Logic EX algorithm for back channels re-creation. Capital "EX" lettering indicates that the back channel re-creation is being forced upon any 5.1 channel source even in the absence of the Dolby back channel enabling flag (YBSE – "Yes Back Surr Encoded"). This forcing feature is governed by SOURCE SETUP→DOLBY→EX APPLY=FORCE . Note: EX APPLY=AUTO would reproduce back speakers only when YBSE flag is present in the source stream., in such a cese lower case "ex" would show.

3. Default screen, playing HDMI input, DTS-encoded multi-channel stream, example 3

```
SRC: DVD    OPT2
IN:  DTS 48k 5.1          ●
OUT:  ES 7.1
VOLUME: -56.0dB
```

Source

Input type: Optical (Toslink), socket #2

Line1: SRC: DVD OPT2

Program encoding: Digital Theatre System

Sample rate (kHz)

Line2: IN: DTS 48k 5.1

Program format (numspeakers.lfe)

Back channel re-creation 5.1➔7.1 using DTS ES mode (NEO:6 Matrix)

Line3: OUT: ES[5] 7.1

Listening format (numspeakers.subwoof)

Line4: VOLUME: -56.0dB

Output volume control (level in dB)

---

[5] Indicates DTS ES algorithm for back channels re-creation. Capital "ES" lettering indicates that the back channel re-creation is being forced upon any DTS 5.1 channel source even in the absence of the DTS back channel enabling . This forcing feature is governmed by SOURCE SETUP➔DTS➔ES APPLY=FORCE. Note: ES APPLY=AUTO would reproduce back speakers only when a DTS back speaker enabling flag is present in the source stream., in such a case lower case "es" would be displayed.