SP 1
SERIES

Bryston

INSTRUCTIONS FOR BRYSTON SP1 PRECISION PREAMPLIFIER/PROCESSOR

For more information, call us today or visit our web site, **1-800-632-8216, www.bryston.ca**

INTRODUCTION

Congratulations on your purchase of the Bryston SP1 precision pre-amplifier/digital processor-decoder. This product will provide you with the finest available signal control and DSP audio processing available. Like all Bryston products the SP1 has been carefully designed and engineered to deliver a lifetime of enjoyment.

Because the SP1 offers both pre-amplifier and digital decoding functions it is very important that you thoroughly read this manual BEFORE you install and use the SP1.

UNPACKING AND ELECTRICAL SAFETY

Your SP1 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.

ACCESSORIES

In the carton you should have found the following accessories in addition to the SP1:

The Bryston Safety Manual
1 IEC standard power cord
1 SP1 Infrared Remote Control unit with backlight
1 9V Battery for the remote - must be installed

It is VERY IMPORTANT that you read and completely understand the Safety Manual before installing or connecting the SP1 to any electrical power source.

SP1 FUNCTIONAL LAYOUT

Below is a block diagram of the Bryston SP1. It shows the signal flow and basic operational structure of the Surround Processor and Preamplifier.

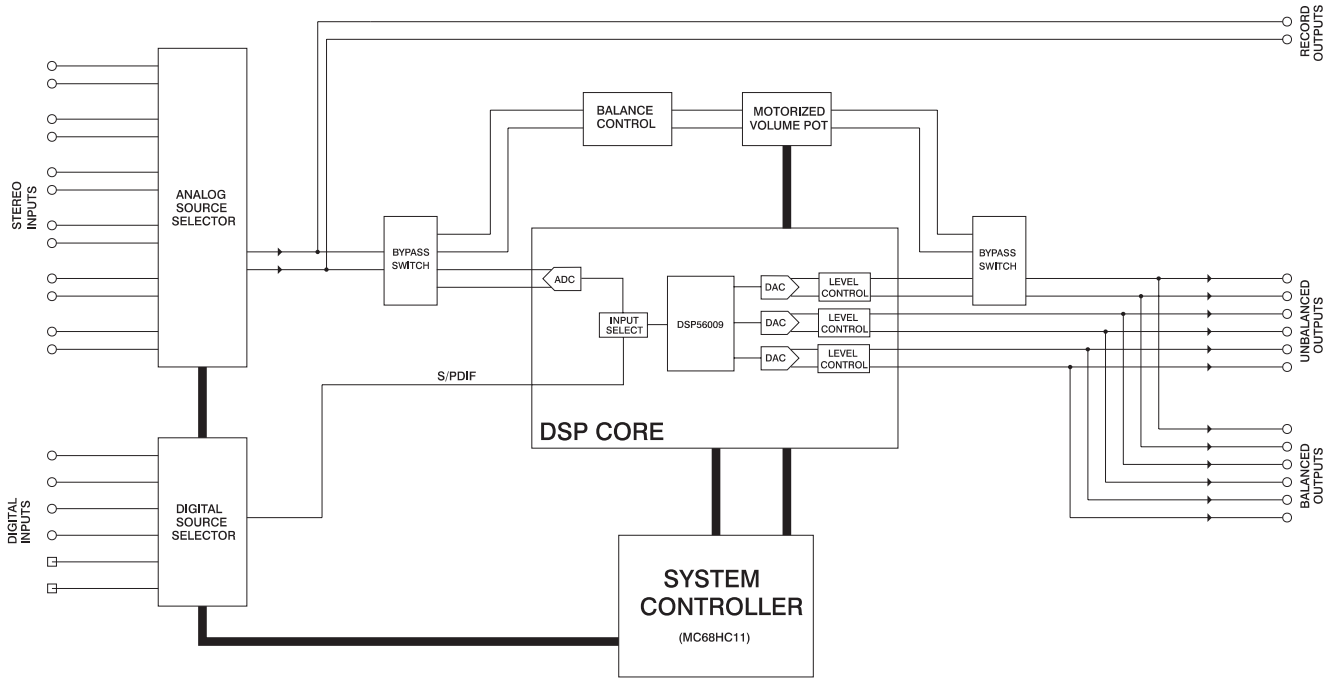


Figure 1: Block Diagram

POWER

The SP1 uses a dual mode electrical power system. In the electrical power input module located on the right hand side of the rear panel, adjacent to the IEC power cord socket is a large computer-style switch that controls the main electrical power to the unit. This is the ONLY switch that actually completely turns off all power to the unit. Please see the illustration below.

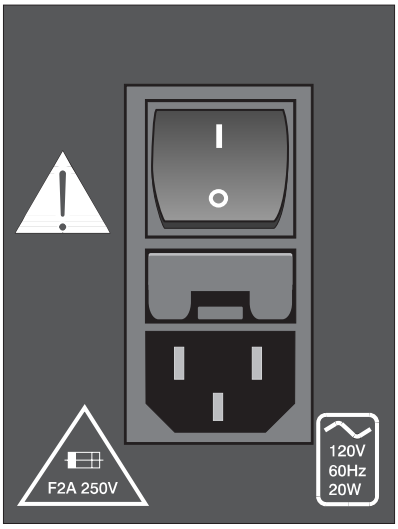


Figure 2 – Power Input Module

When the SP1 is connected to an appropriate AC power source, and the power switch is switched to the 'I' position, the unit automatically sets itself into a STANDBY power mode, where-in only the minimum necessary circuitry to respond to the remote control's power-on command or the momentary power toggle switch on the front panel are active.

Activating the momentary POWER toggle switch (either up or down) on the front panel or the POWER button on the remote immediately takes the unit out of its STANDBY mode into its normal operating mode.

The presence of AC power to the SP1 is indicated by the illumination of the front panel LCD display, the illumination of the LED corresponding to the source you last selected, and the unit's LED operating mode indicators.

[NOTE: If your unit's LCD backlight does not illuminate when the SP1 is plugged into an operating outlet, and switched out of STANDBY mode, please check to see that the rear panel main power switch {mains switch} is in the ON position.]

If the SP1 is to be unused for an extended period of time (i.e. a vacation) it is strongly recommended that it be turned off using the main power switch on the back panel.

CONTROLS AND CONNECTIONS - OVERVIEW

Front Panel Controls and Indicators

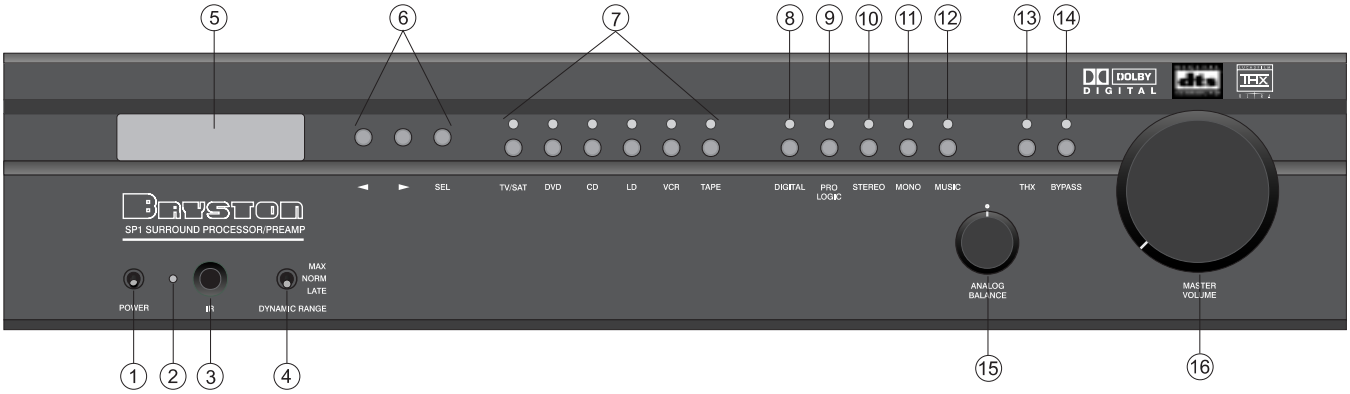


Figure 3: Front Panel

When looking at the front panel of the SP1 you will see the following controls and displays from left to right:

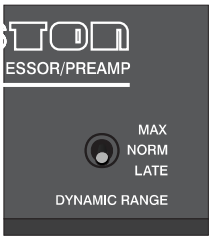
1. Power [Momentary Switch]

Toggling this switch up or down takes the unit in and out of its' Standby power mode (see above)

2. Standby and (IR) Infrared Activity Indicator

If this LED is continuously bright, it is an indication that the SP1 is in Standby mode. When the SP1 is powered up, the LED is OFF, and flashes when a valid IR code is detected.

3. (IR) Infrared Receiver/Sensor for remote control



4. Dynamic Range Control

This three position switch, which will operate only when the SP1 is in a Dolby Digital mode, permits the adjustment of the dynamic range (softest sound to loudest sound) of signal sources producing a Dolby Digital bitstream.

A brief explanation follows:

There are two variables built into many Dolby Digital bitstreams during the encoding process by the program producers, that can enable decoders like the SP1 to provide automatic gain control based upon the information supplied by these data variables.

One of these two variables (labeled Dynrng by Dolby) provides a type of compression useful for situations such as late night viewing of programs with a wide dynamic range (like many action movies). This function can also be used to provide compression for program material that may require enhancement of overall intelligibility (such as some older soundtracks).

Another feature provided by this option is the necessary peak limiting required avoiding signal overload when "downmixing" functions are selected.

The second variable (labeled Compr by Dolby) provides additional peak limiting to allow overall average program level to be increased.

These two algorithms can provide sufficient overall gain reduction to allow even high dynamic range soundtracks to maintain good audibility at low volume levels.

In most cases as an integral part of the Dolby Digital encoding process, a certain minimum amount of dynamic range reduction will be automatically included in the bitstream to ensure safe downmixing. The precise amount of this function is selected by the program producers, and will to a degree depend on the contents of the audio channels.

USING THE DYNAMIC RANGE CONTROL

For the majority of applications this switch should be placed and remain in the middle or NORM position.

For late night viewing or at any time you wish to reduce the overall dynamic range of a program the switch may be set to the "LATE" (down) position.

If you wish to turn off all of the software's built-in dynamic range management functions the switch can be set to the "MAX" (up) position.

NOTE: Caution should be exercised when choosing this option. Many smaller loudspeaker systems cannot handle the extremely wide range signals produced in this mode. Overall system volume should be initially set quite low until you or your dealer are able to determine the maximum safe setting to avoid damage to your loudspeaker systems or power amplifiers.

5. LCD Display window - contains the two line, black on green 16 character per line alphanumeric display which indicates the status and functional mode of the SP1. This screen is also used during the menu-setup function for calibration of the SP1 to your system.

On the first line, the decoding type [Dolby Digital, DTS, Pro-Logic, Music, etc.] is displayed. A sample screen is shown below: (FIG 4)

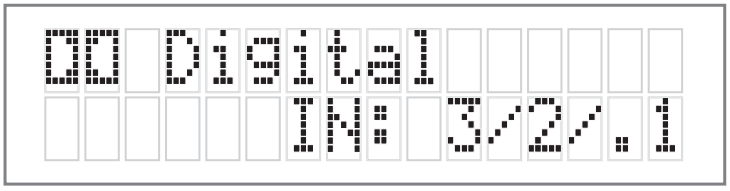


Figure 4: Status display showing Dolby Digital 5.1 channel signal at input

On the second line, the type of signal being detected from the currently selected input is displayed. A sample screen is shown below: (Fig 5)

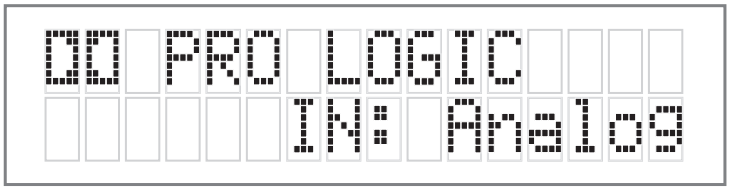


Figure 5: Status display showing analog input signal and Pro Logic decoding

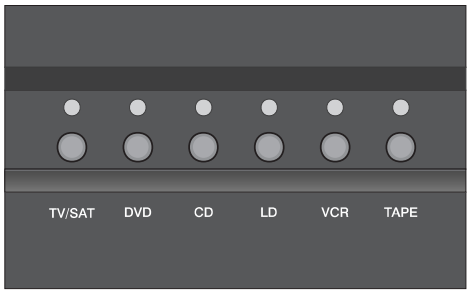
6. Menu Control Buttons

These three buttons labeled "<", ">", and "SEL" (SELECT) are used to control the menu/setup functions displayed on the LCD. To enter a menu mode, you can press any one of these buttons. This will bring up the main menu.
All of the SP1 set-up and calibration operations are done using these buttons and the LCD screen.

Navigating any menu or sub-menu is done using the two arrow (< >) buttons. Once the desired submenu or function is highlighted, pressing "SELECT" will make it the current menu or function.

To exit a menu, or back up a step use the arrow buttons (< >) to highlight the 'X' displayed in the lower right hand corner of the LCD window and press "SELECT".

7. Source Selection Buttons and Indicators



Pressing any one of these buttons will instantly switch the SP1's analog and digital inputs to read the indicated source.

If the SP1 is in its digital mode, as soon as any input is selected and switched, the decoder will automatically try to determine the new bitstream's type and mode

Mode Selection Buttons:

8. Digital Mode and Indicator

This button operates as a three way toggle function. The LED immediately above the button has two colors - RED and GREEN, and an OFF mode where it is not illuminated.

When Digital Mode is selected, the decoder will automatically default to a digital signal for the selected input if one is present.

If a digital signal is present and detected, the SP1 will automatically determine the type of bitstream and select the proper decoding mode. The indicator LED will turn green when this happens.

If NO DIGITAL SIGNAL is detected the SP1 will default back to the analog input for the selected source. This also automatically puts the SP1 into its Digital Standby Mode. When this occurs the LED indicator will turn RED

In this mode, the decoder will continually check the selected source inputs for the presence of a digital signal. If one is detected, the SP1 will automatically switch over to the pre-selected digital operation mode for that source.

To defeat this auto-digital detect mode you must press the button again. If you do the LED will go OFF.

When this mode of operation is selected the SP1 will look at ONLY its analog inputs. If a digital signal does appear the SP1 will NOT recognize it and will remain in its analog only mode until you press the Digital button again to either select the digital source or place the SP1 into its auto detect mode as explained above.

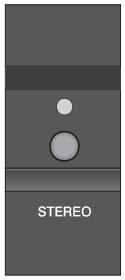
9. Analog Pro Logic and Dolby Digital Pro Logic Mode Switch

In digital mode, this button will produce Pro-Logic decoding on any 2 channel bitstreams. When this function is operational the LED will turn green.

If Pro Logic decoding is NOT allowed with the current bitstream (such as when a DTS signal is present), nothing will happen when the button is pressed.

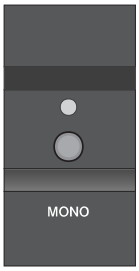
In the SP1 's analog mode, this button will produce standard Pro Logic format decoding on the selected analog input(s).

10. Stereo and Stereo Downmix Mode



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

11. Mono and Mono Downmix Modes



If this button is selected and the supplied bitstream is more than 1 channel, the SP1 software will create a Mono mix of all signals.

Pressing this button repeatedly, will direct the mono signal to different speakers, if your system has them available and the SP1 was setup to recognize your speaker layout during initial calibration. The options in order are:

Mono LR (Left, Right),
Mono Centre

NOTE: Downmix [stereo or mono] is a software based automatic mixing function available within the SP1. This process exists because whenever the number of active decoder outputs or loudspeakers selected in setup is less than the number of channels in the Dolby Digital program, some channel combining will be 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 downmixing 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 SP1 and used to produce the downmix if this mode is selected.

12. Music Modes

Pressing this button will illuminate the LED and sequentially select one of the five available music decoding modes. The five options are: Party, Natural, Stadium, Club, and DTS Music *(see * page 21)*.

NOTE: When you choose to listen to a DTS encoded music CD or music video DVD or LD, please switch to the DTS Music setting and de-activate any other settings such as THX processing as they are not needed.

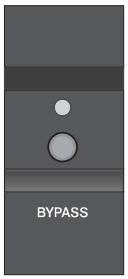
Please see Appendix – A for more details on each of these proprietary music modes.

13. THX Button

Selecting this function (LED illuminated) will automatically incorporate the THX post processing option for all surround modes.
(please SEE Appendix B FOR MORE Information)

NOTE: When you choose to watch a DTS encoded DVD or LD movie, please be sure that the SP1 is in the DTS Movie mode. You may choose to use the THX features to enhance playback of DTS bitstreams for motion pictures. Sources originally mixed for a large environment such as motion pictures may benefit from THX processing.

14. Bypass Button



This button toggles the unit in and out of bypass mode. In bypass mode (LED illuminated) all of the DSP circuitry is bypassed, allowing a completely analog circuit path, identical to the reference standard Bryston BP-25 pre-amplifier.
Only standard format Stereo operation is permitted in this mode - all other functions are disabled.

15. Analog Balance

This control governs the balance of the analog bypass circuit. It will only function if the SP1 is in bypass mode.

16. Master Volume

This is the Large Knob located on the far right side of the front panel. It controls the Master Volume in all modes. It is fully motorized and can be operated from the remote control or by hand. It is the final level setting control on the SP1, and determines what output level will be supplied to the connected power amplifiers, but not the tape/recording outputs. It takes into account any speaker level trim adjustments made during the SP1's setup.

THE SP1 Rear Panel

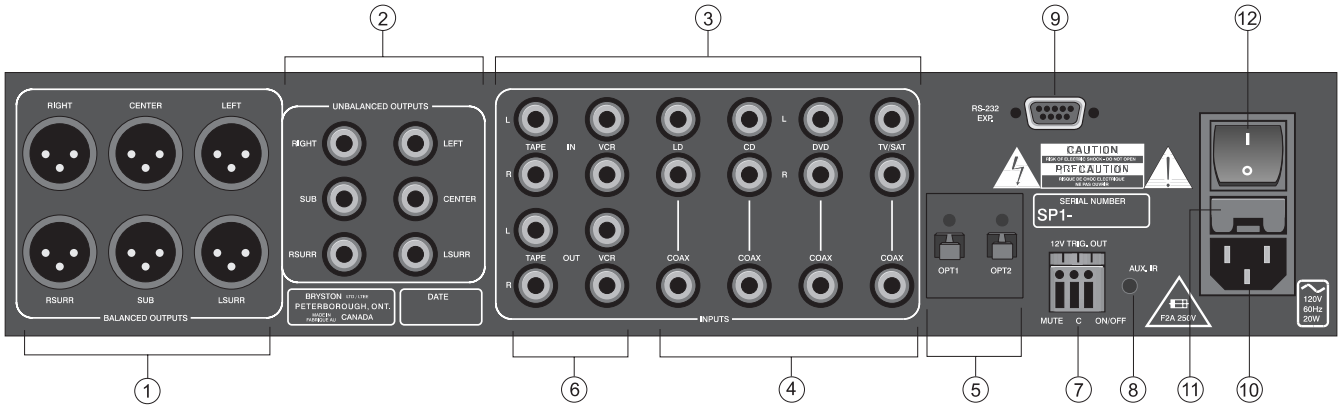


Figure 6: Rear Panel

INPUT AND OUTPUT Connections

1. Balanced and 2. Unbalanced Outputs

The SP1 offers both balanced and unbalanced outputs for power amplifiers or powered loudspeaker systems. The type you select to use will be determined by the input configuration of your amplifiers or self-powered loudspeakers.

3. Analog Inputs

A paired stereo analog input with gold RCA jacks (labeled L and R, for Left and Right) is provided for each source button on the front panel.
The sensitivity of these Inputs is set to the industry standard of 2 Vrms, which should accommodate the vast majority of available source components. In Bypass mode, the input sensitivity is equivalent to the BP-25 preamplifier.

4. Digital Audio Coaxial Inputs

The CD, Laser Disc, DVD and TV/Satellite 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.

5. TOSLINK Digital Audio Optical Inputs

The SP1 offers two assignable TOSLINK optical inputs. These can be designated to any input using the OS menu 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 SP1. The pro model replaces the two TOSLINK connectors with a single AES/EBU connector.

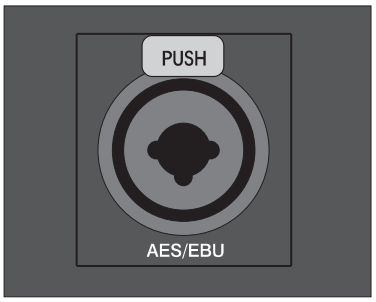


Figure 7: the AES/EBU Pro Digital XLR connector

Setting the Optical Audio Input Assignment

i. Enter the main menu by pressing on one of the menu buttons on the SP1 front panel. Move the cursor to "OS". Hit 'Select' - You are now in the 'Other Settings' (Optical/THX) Menu.

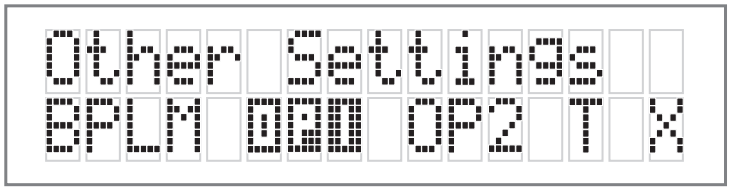


Figure 8: Highlight 'OP1' in the 'Other Settings' Menu

ii. Move the cursor to the Optical Input (OPT1 or OPT2) you want to change the input assignment for. Hit 'Select'.

iii. Now you can assign the optical input to any one of the 6 inputs selectors. Doing this will override the digital coax connector on that input. Hit 'Select' when finished.

NOTE: On the pro model, 'AES' will show up in the 'Other Settings' Menu (instead of OPT1 and OPT2), to setup the AES/EBU input assignment.

6. Tape/Recording Outputs

The SP1 provides two analog outputs for the TAPE and VCR sources. The front panel selected input signal is always routed to these tape outputs, except when TAPE or VCR is selected. In those cases the appropriate output is automatically muted to prevent feedback.

7. Remote 12V Trigger Outputs

Two trigger outputs are provided. The output labeled "ON/OFF" provides a 12V voltage level whenever the unit is fully powered up. When the unit goes into standby, the level is 0 Volts.

The output labeled "AUX" is programmable from the LCD menu as described below. This means that the terminal supplies the 12-Volt signal only when you switch to certain, specified inputs.

The Centre (Common or Ground) terminal is always used with the "ON/OFF" or "AUX" terminals to complete the circuit loop. The 12-Volt connector will accept ¼- inch stripped wire ends, inserted into the square holes provided, and the adjacent screws carefully tightened to hold them in place. These can be used to control any Bryston Power amplifier and many other components such as motorized screens and drapes. Be sure to determine what type of trigger signal the selected components requires and what function will be enabled by the trigger signal's voltage.

Programming the AUX Trigger Output

i. Enter the main menu by pressing on one of the menu buttons on the SP1 front panel. Move the cursor to "OS". Hit 'Select' - You are now in the Other Settings (Optical/THX) Menu.

ii. Move the cursor to "T". (T = Trigger) Hit 'Select'. Now you can assign the AUX Trigger output to ON or OFF, for each of the 6 input sources.

Figure 9: Trigger Assign Menu

iii. To change the source, use the "<" button. To toggle the trigger setting On or Off, use the ">" button. Hit 'Select' to exit when finished.

8. Aux IR Receiver

The Aux IR Input is a miniature mono phone jack connector. This is used to connect externally mounted IR LED receivers, or other extenders that provide modulated IR receiver data. Data is retransmitted by by an IR LED mounted near the front panel IR receiver.

9. RS-232 connector

This connection provides for control of an external video switcher, or remote control of the SP1 functions via a computer interface or AMX/Crestron type controller. Please contact your dealer or Bryston to make use of this optional feature and determine which devices are compatible.

10. IEC Power Connector

11. Fuses

Please note that the Analog and Digital power supplies are fused separately. Replace fuses ONLY with an exact equivalent to avoid damage to the SP1.

12. Master Power Switch

The SP1 Remote Control

Operating the SP1 from the Remote Control is similar to the front panel operation, with a few additions and omissions.

1. Source Select Buttons

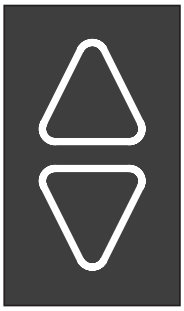
These buttons are used to select the desired source, and function exactly like their equivalent buttons on the front panel.

2. Mode Select Buttons

These buttons are used to change the SP1 decoding mode, and function exactly like their equivalent buttons on the front panel.

3. Mute Button

Pressing this button will fully mute the output of the SP1.



4. Volume/Trim Buttons

These buttons increase and decrease the master volume. When the SP1 is in its Test/Noise mode, these buttons are used to adjust the level trim for each individual speaker.

5. Light/Test Button

When pressed momentarily, this button will illuminate the backlight on the Remote Control. If pressed for more than 3 seconds, the SP1 will enter the Test/Noise mode. Please see Page 18 for more details on this mode.

6. Power Button

Pressing this button will toggle the SP1 in and out of the Standby power mode.

{Installers: please contact Bryston technical support for information about Discrete On/Off control}

SET UP and CALIBRATION OF THE SP1

NOTE: In most operating menu modes the last segment of line 2 of the display will show an "X" for EXIT (a sample screen is shown below - fig 10). Choosing (highlighting) this position in the display and pressing the Select button (see below) will "EXIT" back to the previous menu or out of the particular menu or mode completely depending on where within the menu structure you are at the time. A more detailed explanation is given below in the section on menu control buttons.

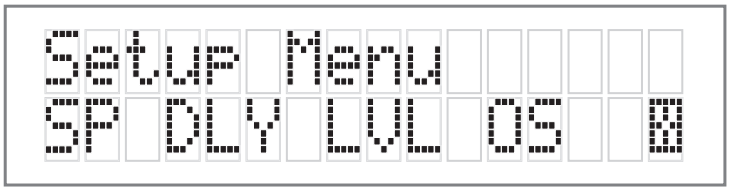


Figure 10: Highlight "X" to EXIT

In order to fully enjoy the capabilities of the SP1 you or your dealer must first set-up and calibrate the SP1. This is a critical step in insuring that all your loudspeakers are properly designated within the unit and that all levels and delays are properly set.

To accomplish this process the following tools are needed:
Tape measure or other means of determining the distance of each speaker from the chosen listening positions.
Sound Level Meter - This device insures that all loudspeaker levels are precisely matched and set accurately. This step cannot accurately be done by ear, a test instrument should be used to ensure proper calibration. (The Radio Shack Analog SPL meter is inexpensive and eminently suitable for this task. Your dealer may have one.)

PLEASE NOTE: If for any reason you are not sure that you can accomplish this calibration task or have any doubts as to how it should be done, please contact your dealer or Bryston technical support BEFORE attempting this process. Most Bryston Dealers can provide this service. Please contact your dealer for their policies and procedures in this regard.

System Setup and Configuration

Setting the Speaker Configuration

Before calibrating levels you must first tell the SP1 about your loudspeaker configuration. To do this:

1. First enter the main menu by pressing on any one of the menu buttons (< - > or SELECT).

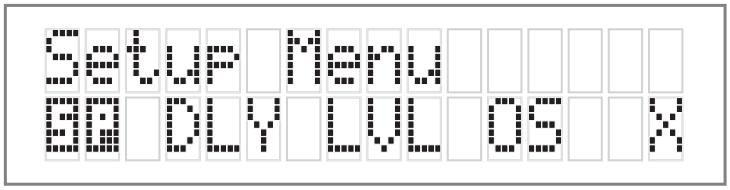


Figure 11: Setup Menu

2. Next move the cursor to "SP". Hit 'SELECT' - You are now in the Speaker Menu.

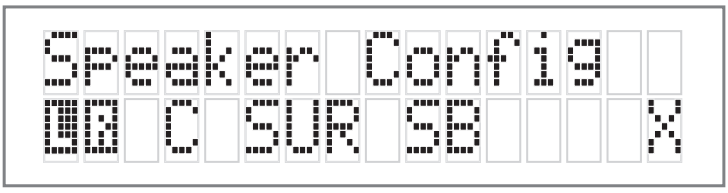


Figure 12: Speaker Configuration Menu

3. Move the cursor to the speaker(s) you want to change the configuration for using the arrow keys (LR, C, SUR, SUB). Hit 'SELECT'.

The options available in this menu are:
For LR you can select SMALL OR LARGE
For CENTRE (C) you can select SMALL, LARGE or NONE
FOR SUR(OUNDS) you can select SMALL, LARGE or NONE
FOR SUB(WOOFER) you can select YES or NO
The SP1's default factory settings as shipped are:
Front = LARGE, Centre = NONE, Surrounds = SMALL, Subwoofer = YES.

4. Once you have completed selecting the settings that match your particular speaker systems please move the cursor to the (X) and press SELECT to exit this menu.

NOTE: LARGE VS SMALL SPEAKER SETTINGS:

It is very important that you understand what is meant by the LARGE and SMALL settings in this menu. They do not refer to SIZE, but to the ability of the particular loudspeaker system to handle low bass/low frequency information. It is very important that you consult your loudspeaker providers instruction manual or the company regarding the capabilities of your particular system with regard to low bass/low frequency reproduction. ***Please note that all THX certified loudspeaker systems are SMALL since a subwoofer is a part of any THX certified loudspeaker system.*** It is strongly recommend that you consider using a subwoofer for any system which you expect

to effectively handle the low frequency dynamics of modern motion picture soundtrack sources such as DVD or HDTV feeds, and many other discrete multi-channel programming sources. If in any doubt choose small, especially if you are using a subwoofer, since this will insure that all the appropriate low frequency information is directed to the subwoofer where it can be most effectively handled.

Setting the Channel Delays

In this step you will need to measure within one foot the distances from your chosen listening/viewing position to the various loudspeaker locations in your system.
You will need the tape measure or other means of making these measurements. You should record this data for future reference.

1. Now, make a measurement from the chosen seated position to each loudspeaker.
2. Next, enter the main menu by pressing on one of the menu buttons on the SP1 front panel. Move the cursor to "DLY". Hit 'Select' - You are now in the Delay Menu.
   The SP1 automatically calculates the required delay time per speaker using the data entered as distance from the listening position. Delays are implemented using DSP RAM and have a maximum value.

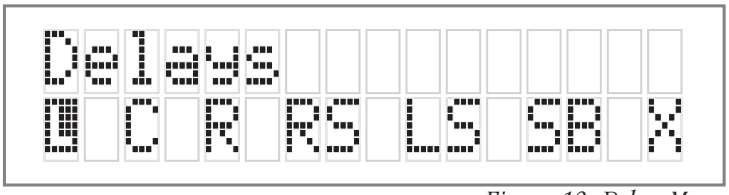


Figure 13: Delay Menu

IMPORTANT: It is recommended that the closest speaker is entered first. The SP1 will calculate the maximum allowable distance from the listening position for the remaining speakers. Please note that delay is represented in feet. For reference, One foot (0.3048 meters) = approximately 1 millisecond of delay.

3. Move the cursor to the speaker you want to set the distance/delay for (L C R LS RS SB). Hit Select. Now you can adjust the Delay value which is equivalent to the distance you measured for the selected speaker using the arrow buttons. Set the delay for each speaker in your system to the nearest foot/meter. Rounding up is OK.

4. Hit SELECT or [X]Exit when finished.
   The SP1's default factory settings as shipped are 10 feet to every speaker, resulting in zero overall delay.

Calibrating and Setting Levels / Channel to Channel Balance.

1. Position the Sound Level Meter at the Centre point of your listening area, at average ear height [approximately 40 - 46 inches {102 - 117 cm.} with its microphone positioned vertically (pointing at the ceiling). DO NOT aim the sensing microphone at the speakers, as this will produce inaccurate level indications.

2. Using the SP1 Remote, press and hold for approximately 3-5 seconds the key labeled "Light - Hold for TEST". It is the key located directly below the Stop-Sign shaped "MUTE" key on the remote control.

IMPORTANT: The Test-Noise Mode can only be initiated from the SP1 remote, and not from the front panel.

The shaped pink-noise test signal will begin with the left-front loudspeaker. If the signal does not appear in this speaker please stop the process and check your wiring and connections for proper configuration.

3. Using the volume up/down arrows on the remote or the arrow keys on the SP1 adjust the level of the noise so that it reaches a predetermined level on the Sound Level Meter. This is the level to which you will set ALL speakers using the test signal and meter. The recommended calibration level is no less than 80dB/SPL. THX specifications call for a level of 85dB/SPL at the listening position.

4. Hit the "TEST" button again to sequence the noise to the next speaker. The sequence is L -> C -> R -> RS -> LS -> SUB. When the cycle is complete, the test noise signal will end, and the unit will switch back to the previous mode. If any output is unused (as defined by 'NONE' in the Speaker Configuration Setup), the noise sequence will automatically skip to the next speaker in the sequence.

Setting Channel Levels without Pink Noise

If you wish to adjust the speaker level trims without using the pink-noise test signal, this can be done from the Front Panel menu system.

1. First enter the main menu by pressing on any one of the menu buttons on the SP1 front panel (< - > or SELECT).

2. Next move the cursor to "LVL". Hit 'SELECT' - You are now in the Level Trim Menu.

3. Move the cursor to the speaker(s) you want to change the level for using the arrow keys (L, C, R, RS, LS, SUB). Hit 'SELECT'. Now you can adjust the Level for the selected speaker using the arrow buttons.

4. Hit 'SELECT' when finished, and repeat Step 3 to change the Level Trim for any of the other speakers.

Setting the THX Subwoofer Limiter or "Bass Peak Level Manager"

1. Enter the main menu by pressing on one of the menu buttons. Move the cursor to "OS". Hit 'Select' - You are now in the Other Settings (Optical/THX) Menu.

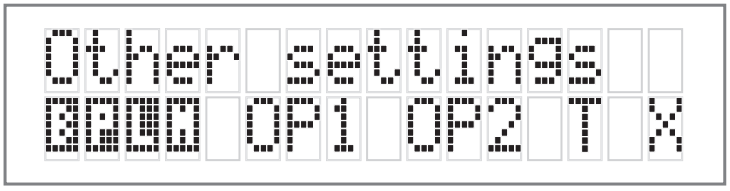


Figure 14: 'Other Settings' Menu

2. Move the cursor to 'BPLM'. Hit Select. [BPLM=Bass Peak level Manager]
   You will see the following screen.

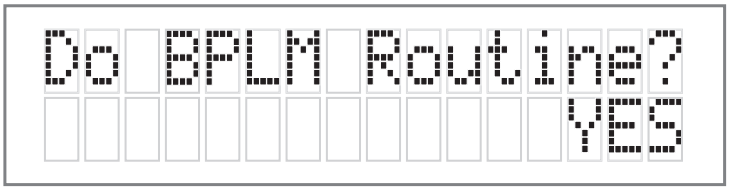


Figure 15: BPLM Routine Query

3. Hit 'SELECT' and you will see the adjustment screen picture below appear, and you will hear a low level Pink Noise signal coming from your subwoofer and/or large speakers.

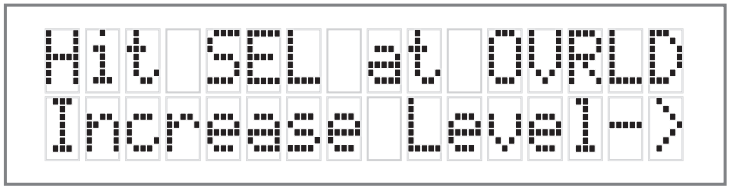


Figure 16: BPLM Adjustment Screen

Now you can adjust the value of the subwoofer limiter (-40 to 0 dB). Slowly increase the level by pressing the ">" button (display counting up from -40) until you hear overload/distortion/bottoming/popping from your subwoofer(s). When you do, reduce the value shown by 1dB and Hit 'SELECT' to save the setting. You can always return to this menu to make further adjustments if needed. For more information on the BLPM see the THX section in the appendix.

Setting the BPLM without Pink Noise

To adjust the BPLM setting without running the Noise routine, Enter the BPLM as above, but when the SP1 prompts "Do BPLM Routine?", use the arrow keys to select 'NO' and hit 'SELECT'. This will bring up the numeric value of the BPLM setting without the noise signal. You can now adjust the value using the arrow keys, and hit 'SELECT' when finished.
Caution: If the BPLM is set to "OFF" or "0", the Bass Limiting function is disabled. In this case, you may run the risk of speaker damage due to bass overload. Please be sure that your speaker system can handle high bass levels before disabling the BPLM.

Acknowledgements

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APPENDIX A - SP1 MUSIC MODES

Pressing the MUSIC mode button will illuminate the LED and let you sequentially select one of the four available music decoding modes for 2 channel signals.
These special modes are designed to expand your enjoyment of almost any 2 channel music source and many other 2 channel signals. You are encouraged to experiment with the options on various sources. Not all will supply something you may like, but there are so many variables that it does pay to take a few moments to listen to the options.
The custom SP1 Music Modes use a set of proprietary DSP algorithms to create a set of simulated signals using the original left and right 2 channel data and feeds these to the to centre and surround speakers. The Music Mode algorithms do NOT in any way modify the original 2 channel signals that are sent to your main left and right channel speakers.

The five options you have are:

Party:
This mode is designed for "Party" situations, where you may have a room full of people, who have no direct path to the main speakers. The Centre channel is not used. Left is copied

to left surround and right to right surround, creating essentially a giant Stereo image throughout your space. The Music mode delay settings have no effect in this mode. This works especially well on lots of pop/rock music and also for many recordings with good natural ambiance.

Natural:
This mode enhances basic stereo reproduction by using the inherent acoustics recorded within the source material. It is generally suitable for use with all kinds of music. 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. This mode sends a summed L+R signal to the centre channel. A difference signal (produced by L-R) is decorrelated to both surround channels without any timbral coloration.

Stadium:
This mode produces a Stadium and or simulation of a Large Room type effect. It generates strong reflections and is most suitable for live music events, simulcasts, and most live sports. The L+R sum signal is sent to the centre channel, while the same signal is also sent through a custom echo algorithm to the surround channels.

Club:
This mode closely simulates a nightclub or a small room type of space using a fast decay echo algorithm. It nicely recreates a small room full of people, and is very useful with pop and rock music. The L+R sum signal is sent to the centre, and also to the custom echo algorithm where it is also lowpass filtered before being sent to the surround speakers.

* **DTS MUSIC**
This mode is used ONLY when a DTS bitstream is detected. It is optimized to provide proper playback of DTS encoded musical material from DVD, LD or CD sources. A similar mode called DTS Movie is available for playback of DTS encoded motion picture soundtracks from DVD or LD sources. The SP1 will auto-detect DTS bitstreams and select the correct mode automatically in the vast majority of cases. You may manually select these modes ONLY if a DTS bitstream has been detected initially.

(Please note that the apparent effect of the Music Mode can be adjusted by altering the delay parameters and channel volume of the centre, left surround and right surround speakers using the appropriate menus).

Remember there really are no "correct" settings that will work equally well for all kinds of music. You may need to adjust the parameters and mode depending on the music material.

APPENDIX B - THX INFORMATION

Below is a summary of issues and information related to the proprietary and patented THX processing incorporated used in the SP1. The available space cannot include all the available information on this topic. Therefore, if you want more information or wish to research the topic in more detail please use the THX website at WWW.THX.COM. The information below was condensed from documentation supplied by THX.

When you choose the THX option for all surround decoding modes within the SP1, by pressing the THX button on the front panel or the remote an additional processing method is activated.

The additional signal processing used in this mode is the result of extensive research, testing and refinement by the technical and engineering staff at LucasFilm, Ltd.

All movie soundtracks regardless of their original encoding format (Dolby Digital, Dolby Pro-Logic, DTS, Stereo or Mono). The THX mode would not normally be activated for music or movies that were made specifically for television or other broadcast shows such as sports programming. The THX processing, designed to compensate for large room mixing environments is not required for these programs because they are normally mixed/post-produced in small room environments, as opposed to the large room environments normally used for theatrical motion picture mixing/post-production.

The SP1's THX mode adds additional DSP to the either the Dolby or DTS processing already in place to help create a more precise match between the sound produced within a commercial motion picture theater and the sound produced in your residential 'theater'.

THX's research shows that this is necessary because, all of the multi-channel film sound formats were originally designed and spectrally balanced for use within large commercial movie theaters.

Moreover, the specially equipped and designed theater used by the sound mixing professionals to produce the final theatrical audio track on any film (called a 'dubbing stage') is also considerably larger than your 'home theater' since it was created to replicate the environment of a typical commercial cinema space, not your home theater space.

It is in those "dubbing stages" that the dialogue, sound effects and music are all individually recorded and mixed to a six (5.1) or four channel(Pro- Logic) soundtrack for release in commercial movie theaters. This is the same soundtrack that is later released on videotape and DVD for playback in a Home Theatre system.

During their research, the THX engineers identified the fundamental tonal and spatial errors created when Theatre environment film sound tracks are reproduced in residential spaces.

The SP1, contains special processing designed by THX to correct those errors and restore the appropriate tonal and spatial balance to a movie soundtrack, so that you can hear what the film's producer/director intended.

This processing includes:

1. An Electronic Crossover
Electronic Crossovers allow the use of the more typical residentially sized smaller main speakers by sending the bass signals to a separate subwoofer.
With Dolby Pro Logic sources, only the main front channels pass through the crossover. For Dolby Digital or DTS sources, all channels pass through the crossover.

2. Re-Equalization
This processing is designed to correct the excess high frequency content or brightness of movie soundtracks.
This excess brightness occurs because as noted above motion pictures are mixed in spaces representing the size and acoustics of movie Theatres which incorporate a special international standard called the "X-Curve". This frequency response curve is used because there is a natural high frequency rolloff (loss) when sound sources are some distance from the listener. This is the case with the speakers in a commercial cinema.
When the speakers are much closer, such as in a home cinema, the soundtrack will be excessively bright.
The THX processing uses a special Re-Equalization Curve, designed for home environments, to restore the correct tonal balance of a movie soundtrack.

3.Timbre Matching
In a commercial Theatre, the multiple loudspeakers used are in front [the LCR speakers], and all around you [the surround speakers located along the sides, and behind you]. The many surround speakers are carefully equalized to match the front channels.
The THX Timbre Matching processing corrects the surround tonal balance to match the front channels so you hear one continuous soundfield.
Additionally for the majority of residential systems, the system must also correct for the fact that only two surround speakers are used.
The THX processing help to insure that there is always smooth sound movement from front to the surrounds. This helps to place you, the listener, inside the movie experience.

4. Adaptive Decorrelation
Additionally the THX processing system is designed to deal with the fact that in Dolby Pro Logic mode (the system used on the vast majority of videotape versions of movies) the surround channels are monophonic.

In a commercial Theatre, you don't detect this because the large number of surround speakers and the reflections within the room prevent your two ears from receiving equivalent signals.
The THX Decorrelation Circuit discreetly changes the time and phase of one surround channel versus the other preventing your left and right ears from hearing identical signals, and helping to re-create the spacious and ambient sound you experience in a commercial Theatre.
In Dolby Pro-Logic mode, with THX processing selected, the Adaptive de-correlation is operative at all times since the surround signals are entirely monaural. This proprietary THX processing algorithm also works effectively in Dolby Digital and DTS film playback modes.
Even though motion picture sound-track mixing engineers now have the option in these formats to create different information for the discrete surround channels these encoding processes offer, a significant portion of the overall soundtrack may still be monaural. The unique adaptive nature of the THX de-correlation processing detects monaural signals, and only operates when such signals are present.
You can safely leave the THX processing engaged for all motion picture playback modes, with the assurance that the processing will only affect the type of signals it is designed to enhance.

5. Bass Peak Level Manager
To diminish the chance that your subwoofer will overload from the large amount of bass, often present in the LFE channel the system uses a Peak Management circuit which works with the data you supplied during speaker setup to help match the subwoofer output to your specific subwoofer's capabilities.
Please note that the factory default for the BLPM is -20 dB since the capabilities of your specific subwoofer are unknown.
In the SP1 setup and calibration section above ,the final step you should have performed was to set the BLPM for your subwoofer's specific capabilities. If you have not does this you should return to the setup section (see page zxx) and do this now.

6. Loudspeaker Position Time Synchronization
In an ideal world your theater space would allow you to be an equal distance from every speaker you have installed.
Unfortunately most residential spaces do not allow this condition to exist.
The THX Loudspeaker Position Time Synchronization circuit allows you to digitally adjust the apparent position of each speaker in your system for the best multi-channel imaging and smoothest frequency response.

NOTE: Both the Bass Management(#5 above) and Position Synchronization (#6 above) settings are accomplished during the system setup operation. Once completed they normally do not need additional adjustments unless you change speakers or speaker positions.

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