

# BRYSTON

**9Bsst<sup>2</sup>**  
OWNER'S MANUAL

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**INTRODUCTION**

Thank you for choosing the **9BsST<sup>2</sup> Five Channel Power Amplifier**. Bryston welcomes any suggestions you may have, or comments regarding the operation of your amplifier. We consider you, our customer, to be Bryston's most important resource, and your opinion is very much appreciated. Contact information is located on the rear cover.

**DESCRIPTION**

The 9BsST<sup>2</sup> is a modular design 5 x 120 Watts per channel audio power amplifier. Each channel selects a balanced or single ended input. Each channel selects a gain of 29dB(1v), 23dB(2v) or 17dB(4v). Each channel input may be operated inverted or non-inverted operation (0 or -180 degrees). The power up of the 9BsST<sup>2</sup> may be controlled by a remote control voltage. The 9BsST<sup>2</sup> includes 'soft start' power control circuitry to eliminate high inrush currents when AC power is applied.

**SHIPPING BOX & PACKING MATERIAL**

Please keep the original shipping box and all packing material. This will ensure the amplifier is protected in future transport. In the unlikely event you have a problem and must return it for service you must use the proper packing material. Ship the amplifier only in the original packing material, as the unit is not insurable by carriers otherwise.

**INSTALLATION**

The most important installation consideration is **ventilation**. The 9BsST<sup>2</sup> is a convection-cooled amplifier. Unrestricted air-flow across its heat sinks is a must. For this reason do not install anything directly above it. Allow 3.5" (2u) to 5" (3u) inches of space above and to the sides of this amplifier. Provide a minimum 6" space to the rear of the 9BsST<sup>2</sup> for ventilation and dressing cables to and from the amplifier. Do not install directly above other heat generating equipment. Should your installation conditions be constricted, then additional forced air-cooling may be necessary. Bryston can provide an optional fan package if required. Any 9BsST<sup>2</sup> channels thermally shutting down during operation indicates insufficient cooling, and a remedy must be found for cooling the amplifier.

**Never operate the 9BsST<sup>2</sup> in a vertical position.** For further information on rack mounting the 9BsST<sup>2</sup> refer to the technical memo "9BsST\_RACK\_MOUNTING\_INSTRUCTION\_SHEET.pdf" in the Technical Information section of Bryston's web site ([www.bryston.com](http://www.bryston.com)).

**SPEAKER WIRES**

Wires connecting the amplifier to the speaker should be as short as practical. Use quality wire and if runs are more than 3 meters use at least 12 gauge wire. The speaker binding posts will accept wire up to 3 gauge wire. Bryston can custom build cables for your application.

**AC POWER**

Before plugging in the power cord be sure your 9BSST<sup>2</sup> is specified for the **correct AC voltage** for your locality. The voltage is listed to the right of the power input connector. The circuit feeding the 9BSST<sup>2</sup> should be sufficient so as not to cause the circuit breaker to trip. Note: the 9BSST<sup>2</sup> when operated with all channels at maximum power into 4 ohm loads, can consume all the available power in a normal household circuit, therefore a dedicated electrical circuit may be necessary with this situation. Never lift the safety ground to the amplifier or remove the ground pin from the plug.

**POWER CONDITIONERS**

Bryston urges caution in choosing a power conditioner for your audio/video system. Large power amplifiers can draw very substantial current from the wall plug, and many so-called power conditioners can in fact hinder the supply of current by inserting resistances in series with the line cord. However, there are now power conditioners that can reduce or eliminate RF and 'hash' from the AC supply and may actually improve current delivery to your system. This type of power conditioner (exemplified by 'TORUS' Power Conditioners) uses the energy storage in a large toroidal transformer to provide high instantaneous power and reduce the substantial AC output resistance of the wall socket and house wiring. This resistance can be in the range of 0.5 to 1 Ohm and is typically reduced to only a few milli-Ohms by the Power Conditioner. That in turn considerably reduces Voltage drop in the power line on high current surges and quite substantially increases the stability of the power line improving audio (and video) focus, precision and clarity.

**REAR PANEL DETAILS**

**1. INPUT SELECT SWITCH.**

Each 9BSST<sup>2</sup> channel gives the user the option of switching between either balanced input or single ended input.

**2. BALANCED INPUT CONNECTOR (Z<sub>in</sub> ≈ 20k )**

This input connector accepts standard 'XLR' or 1/4" Tip-Ring-Sleeve . Use quality, 100% shielded cables with *gold plated* connectors.

**3. SINGLE ENDED (UNBALANCED) INPUT (Z<sub>in</sub> ≈ 30k)**

This input connector accepts standard 'RCA' or 'Phono' connectors. Use quality, 100% shielded cables with *gold plated* connectors.

**Balanced input Vs Single ended input:**

The balanced input requires a balanced pre-amp source. Balanced systems provide noise protection from external electrical interference, so cable length can be very long (50m or 164 ft) or longer.

The single ended or unbalanced input is provided for pre-amps without balanced output. Single-ended cables should be kept to 10m (33 ft) or less. In general never use longer cables than necessary, never coil excess cable length, and run signal wires away from AC power or speaker cables.

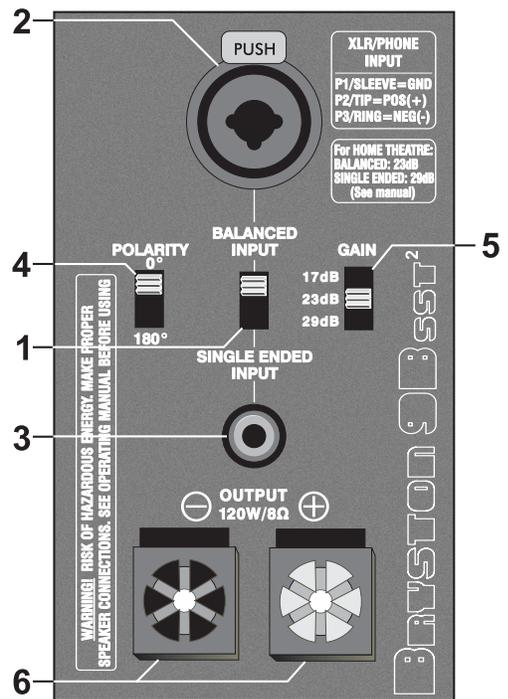
**4. POLARITY SWITCH ( 0 OR -180 DEGREES)**

Each 9BSST<sup>2</sup> channel gives the user the option of inverting the polarity of the input signal -180 degrees. Polarity inversion is application specific. *The normal operating position is 0 degrees.*

**5. GAIN (SENSITIVITY) SWITCH.**

The **29dB** setting is the usual *home theatre* setting for *single ended* or un-balanced operation. It provides the most amplifier gain and the greatest sensitivity (1V<sub>in</sub> = 100W @ 8 ohms with signal-to-noise of -110 dB). A signal level of 1.1V at the input is required to deliver the rated output of 120W into 8 ohms.

The **23dB** setting is the usual *home theatre* setting when using balanced inputs. Or use this setting with any sys-



tem where there is already too much gain, for example where the volume control rotation is limited to the bottom half of the control (7 to 12 o'clock) or less. Sensitivity at this gain setting is  $2V_{in} = 100w @ 8 \text{ ohms}$  with signal-to-noise of -112 dB). A signal level of 2.2v at the input is required to deliver the rated output of 120W into 8 ohms.

The **17dB** setting is used when the input voltage is fairly high or in ultra sensitive systems where the volume control rotation range is still limited when using the 2v setting. Some pre-amps may be unable to deliver enough level to use this setting. Sensitivity at this gain setting is  $4V_{in} = 100w @ 8 \text{ ohms}$ , noise -115 dB). A signal level of 4.4v at the input is required to deliver 120W into 8 ohms.

The noise is referenced in dB below rated output of 120 watts. Different input configurations result in slightly different noise readings. The above noise ratings represent minimum readings, actual readings may be better.

**6. OUTPUT BINDING POSTS**

The **RED** binding post is connected to the **amplifier output**. Connect to this post the (+) terminal on the loudspeaker. The **BLACK** binding post is connected to **signal ground**. Connect to this post the (-) terminal on the loudspeaker.

When the **polarity** switch is set for **0** degrees (**normal** operation) the output at the **RED** binding post is **in phase** with the input signal.

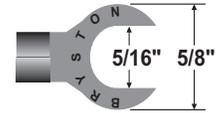
When the **polarity** switch is set for **180** degrees (**inverted** operation) the output at the **RED** binding post is 180 degrees out of phase with the input signal.

The Output binding posts provide three different interconnect options. Combinations may be used when bi-wiring. See figure 2 below. Cables should be kept as short as practical and should never be terminated with connectors that may become confused for AC power connectors. Cables should be dressed away from input and power cables.

**SPEAKER CONNECTORS**

**BANANA PLUGS** offer a quick disconnect option. Before inserting a banana plug into the binding post be sure to tighten the post nut to avoid rattling and to provide full insertion of the banana plug. Gold plated locking banana plugs are available from Bryston.

**SPADE LUGS** provide high contact area and secure fastening. Lugs should be gold plated. See diagram for details. Post diameter is 5/16" ( 8mm ),lug width 5/8" (16 mm). Gold plated spade lugs are available from Bryston.



**STRIPPED BARE WIRE** up to 3 gauge can be inserted through the hole in the binding post and held in place by tightening the post knob. Additional tightening pressure can be achieved using the wrench provided in the slots of the knob. Do not over tighten or the binding post may become damaged. Note that copper wire is malleable and may require further tightening after the initial installation.

**FRONT PANEL DETAILS**

**9BSST<sup>2</sup> Power Switch**

The front panel recessed push button labelled **SST<sup>2</sup> POWER** is a push-ON/push-OFF switch used to apply or remove AC line power to the 9BSST<sup>2</sup> circuitry. Push in once to initiate the power-up sequence and again and the 9BSST<sup>2</sup> will power-down. ( Note: the rear circuit breaker must be on for the 9BSST<sup>2</sup> to power-up)

**LED Indicators**

Each 9BSST<sup>2</sup> channel has an LED indicator to monitor the following conditions:

- UNLIT: indicates channel has no power.
- RED: indicates channel is muted (power-up or power-down sequence)
- GREEN: indicates channel operation is normal.
- FLASHING RED: indicates channel clipping.
- ORANGE: indicates channel thermal shutdown.

**POWER UP SEQUENCE**

After pushing the 'SST POWER' switch, each channel LED will turn from unlit to red (mute). When the power supplies have stabilized the channel will come out of mute and the LED will change to green (normal operation).



### UNLIT LED ( NO POWER )

The 9BSST<sup>2</sup> channel LEDs, when unlit, indicate no AC mains power is present at the channel. If all channel LED indicators are unlit the 9BSST<sup>2</sup> probably needs only to be powered on. A single LED not lighting possibly indicates blown channel fuses.

**N.B.** When checking fuses switch off the circuit breaker on the rear panel and unplug the power cord. Use only the specified 250V 5mm x 20mm fuses. See page 6 for the fuse locations.

### CLIPPING ( FLASHING RED )

Clipping occurs when the channel output level no longer can follow the level increase at the input (Over driven input condition). When a 9BSST<sup>2</sup> channel is driven into clipping the channel LED will change from green to red then back to green when the level is reduced ( Flashing Red ). Momentary clipping can be tolerated, however it indicates that maximum un-distorted power has been surpassed and potential speaker damage may result if overload conditions persist. Any amplifier that is constantly operated into clipping indicates a more powerful amplifier is needed for that application.

### THERMAL SHUTDOWN ( ORANGE )

The 9BSST<sup>2</sup> channel has thermal shutdown circuitry to prevent damage due to overheating. Should thermal shutdown occur, the channel will mute, and the channel LED will turn orange indicating this condition. When the channel has cooled to a safe operating condition the channel will return to normal operation. Persistent Thermal shutdown indicates steps need to be taken to increase airflow across the channel or channels heat sink. ( Also see installation section on ventilation ).

**NOTE:** In some markets the LED indicators, which are normally red/green, may be red/blue instead. When red/blue LEDs are supplied green is replaced with blue and orange is replaced with magenta in the above descriptions.

## POWER ENTRY PANEL

### 1. MASTER POWER SWITCH/CIRCUIT BREAKER.

The 9BSST<sup>2</sup> uses a magnetic-trip circuit breaker (1) to protect the amplifier. This switch should be 'OFF' when installing the 9BSST<sup>2</sup>. When switched 'OFF' all AC power is removed from the amplifier, including standby power. The circuit breaker is not the day to day power switch and should be switched and left 'ON' after the installation is complete. Use the front panel power switch (labelled "9B SST<sup>2</sup>") or an external control voltage to Power-up or Power-down the amplifier. Should the breaker trip, lower or remove the amplifier input signals. Switch the breaker to the 'ON' position. Then power the unit up normally. **The circuit breaker must be 'ON' at all times for the 9BSST<sup>2</sup> to operate.**

### 2. AC POWER INPUT.

This is a high current plug for the power cord receptacle. Check that the voltage rating at the right of the connector conforms with your locality. With the circuit breaker 'OFF' insert the power cord into the 9BSST<sup>2</sup>, then plug the other end to an appropriate AC power outlet.

### 3. DATA PLATE

Label containing the exact model name, electrical rating, serial number, model revision, date of manufacture (date

code: YYWW where YY is the 2 least significant digits of the year and WW is the week of the year from 01 to 52).

**4. EXTERNAL TURN-ON (REMOTE/LOCAL)**

**REMOTE:** To power-up the 9BSST<sup>2</sup> using an external control voltage, supply a 4v to 12v AC or DC control voltage to the 'IN' terminals of the *External Turn-On* connector ( 5 ). Use insulated 18-22 gauge stranded wire between the source device and the 9BSST<sup>2</sup>.

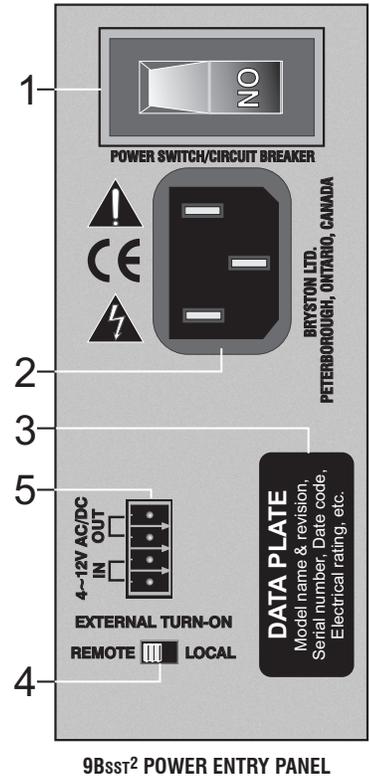
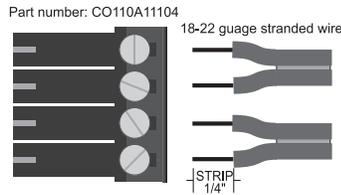
Immediately following power up, the control voltage will appear at the 'OUT' terminals of connector (5) for the control of other equipment. The removal of the control voltage causes the 9BSST<sup>2</sup> to turn off and the control voltage at the 'OUT' terminals is interrupted. The 9BSST<sup>2</sup> draws less than 2mA of current from this control signal.

**LOCAL:** in this position the 9BSST<sup>2</sup> will ignore the control voltage and power up only by using the front panel power switch.

**N.B.** The Power Switch/Circuit Breaker on the power entry panel at the rear of the 9BSST<sup>2</sup> must be ON for the unit to operate.

**5. EXTERNAL TURN-ON CONNECTOR**

A 4 terminal connector (plug) with screw tightened bare wire cage-clamps is provided with each 9BSST<sup>2</sup>. This connector is in turn plugged into the 4 pin header in the 9BSST<sup>2</sup> to facilitate easier hookup and or removal of a remote control power on/off signal. Replacement or additional plugs are available from Bryston. (Part no. CO110A11104)



**TECHNICAL SPECIFICATIONS**

|                             |   |
|-----------------------------|---|
| <b>POWER OUTPUT:</b>        | 120 watts per channel into 8 ohms<br>200 watts per channel into 4 ohms  |
| <b>GAIN / SENSITIVITY:</b>  | 29dB (1.1Vin = 120W @ 8 Ohms)<br>23dB (2.2Vin = 120W @ 8 Ohms)<br>17dB (4.4Vin = 120W @ 8 Ohms )  |
| <b>INPUT IMPEDANCE:</b>     | 30K ohms (±5%) single ended<br>20K ohms (±5%) balanced (each leg)   |
| <b>DISTORTION:</b>          | < 0.005% 20Hz to 20kHz at 120 watts into 8 ohms,  |
| <b>IMD &amp; THD+NOISE:</b> | < 0.007% 20Hz to 20kHz at 200 watts into 4 ohms   |
| <b>NOISE:</b>               | Measured with input shorted (20Hz to 20kHz.)<br>>110dB below rated output 29dB gain (- 73dBu)<br>>113dB below rated output 23dB gain (- 76dBu)<br>>116dB below rated output 17dB gain (- 79dBu) |
| <b>SLEW RATE:</b>           | >60 volts per microsecond   |
| <b>POWER BANDWIDTH:</b>     | <1 Hz to over 100 kHz   |
| <b>DAMPING FACTOR:</b>      | Over 500 at 20 Hz, ref. 8 ohms  |

|   |  |
|---|--|
| <b>DIMENSIONS:</b>                        | 19" Rack mount version: 48.3 x 13.3 x 48.5cm<br>(19"w x 5.25"h x 19.1"d) with handles<br>17" version w/o handles: 43.2 x 13.3 x 44.4cm<br>(17"w x 5.25"h x 17.5"d)   |
| <b>SHIPPING WEIGHT:</b>                   | approx. 34.5kg (76 lbs)  |
| <b>POWER CONSUMPTION &amp; HEAT LOAD:</b> | single channel 120W @ 8 ohms: 242 Watts<br>5 channels @ 120W @ 8 ohms: 1397 Watts<br>Max. Heat Dissipation 8 ohms: 2720 Btu/Hr.<br>single channel 200W @ 4 ohms: 422 Watts<br>5 channels @ 200W @ 4 ohms: 2295 Watts |

**MORE INFORMATION**

More information about the 9BSST<sup>2</sup>, including schematic drawings and other technical information, is available at [www.bryston.com](http://www.bryston.com). For example:

**BRIDGING CHANNELS:**

For information on bridging 9B channels refer to the document "6B-9B-BRIDGED-HOOKUP.pdf" which can be found on [www.bryston.com](http://www.bryston.com) in TECHNICAL INFORMATION ▶ SST2 Amps ▶ 9BSST<sup>2</sup> ▶ MEMOs

**RACK MOUNTING INSTRUCTIONS:**

For further information on rack mounting the 9BSST<sup>2</sup> refer to the document "9BSST\_RACK\_MOUNTING\_INSTRUCTION\_SHEET.pdf" which can be found on [www.bryston.com](http://www.bryston.com) in the TECHNICAL INFORMATION section.

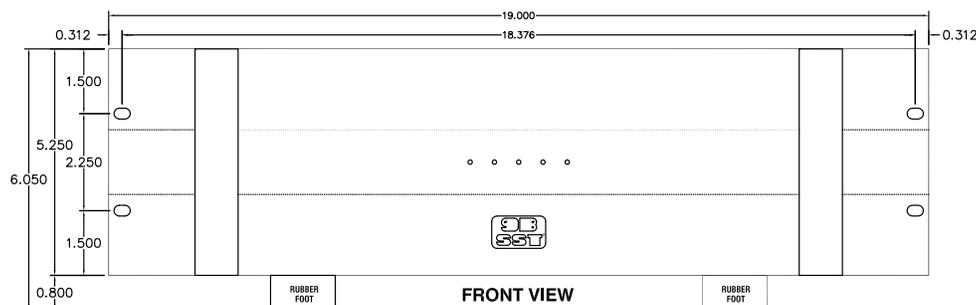
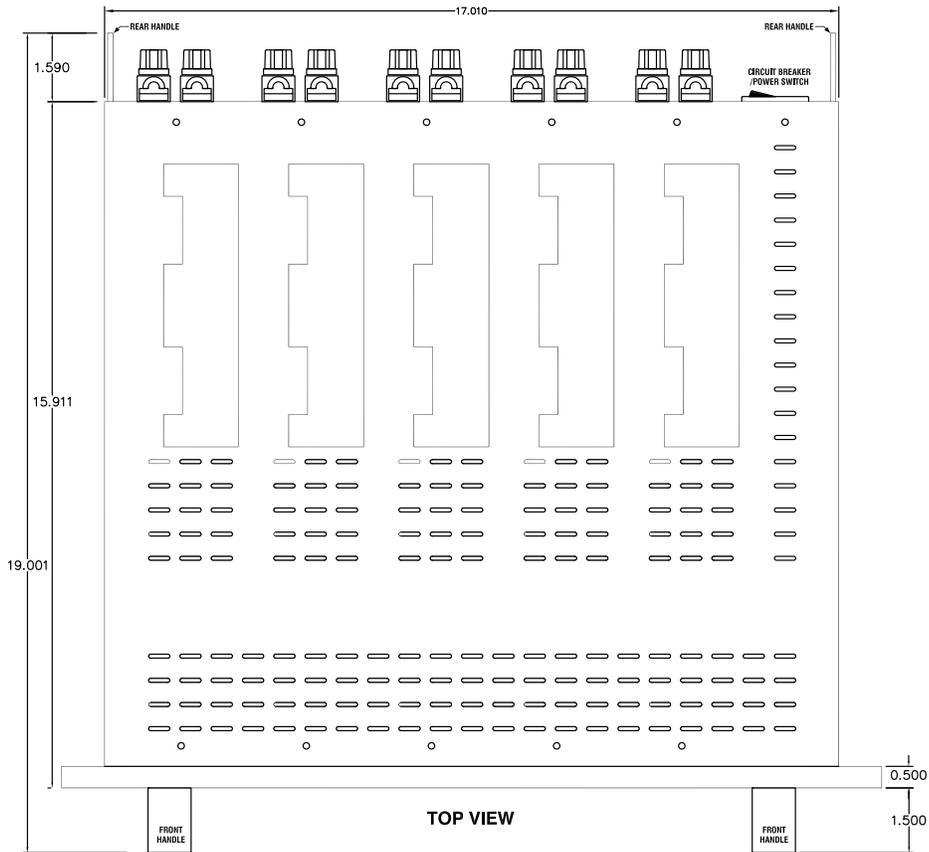
**FUSES**



There are two 5x20mm cylindrical glass fuses located at the end of each 9BSST<sup>2</sup> main board. For 100-120 VAC models replace fuses only with the 2A/250V fast acting types (e.g. Littelfuse 217002). For 200-240VAC models replace only with 3.15A/250V time lag fuses (e.g. Littelfuse 2183.15). Before attempting to replace fuses, power down amplifier using the Circuit breaker/Power switch on the rear Power Entry panel & disconnect the power cord. Channels are secured by screws on both the top and bottom panels.

**EXTERNAL DIMENSIONS**

ALL DIMENSIONS IN INCHES



## 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.**

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## 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 centers 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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### **BRYSTON SERVICE in CANADA:**

Postal address: **PO. BOX 2170, Stn. Main  
PETERBOROUGH, ONTARIO  
CANADA K9J 7Y4**

Courier address: **677 NEAL DRIVE  
PETERBOROUGH, ONTARIO  
CANADA K9J 6X7**

PHONE: 705-742-5325  
FAX: 705-742-0882  
E-mail: [cdnser@bryston.com](mailto:cdnser@bryston.com)

### **BRYSTON SERVICE in the USA:**

**79 COVENTRY ST., Suite 5  
NEWPORT, VERMONT  
U.S.A. 05855-2100**

PHONE: 802-334-1201  
FAX: 802-334-6658  
E-mail: [usaser@bryston.com](mailto:usaser@bryston.com)

### **BRYSTON SERVICE outside Canada and the USA:**

contact your local distributor or

CHECK OUR WEB SITE: [www.bryston.com](http://www.bryston.com)  
E-MAIL BRYSTON DIRECTLY: [cdnser@bryston.com](mailto:cdnser@bryston.com)  
FAX BRYSTON DIRECTLY: 01-705-742-0882  
PHONE BRYSTON DIRECTLY: 01-705-742-5325