DYNAMIC SOUNDS ASSOCIATES

Pre I

USER MANUAL

120 VAC Operation

Series P1.24

DSA

Dynamic Sounds Associates

Naples, Florida

DYNAMIC SOUNDS ASSOCIATES
Pre I
USER MANUAL

WELCOME

Dynamic Sounds Associates welcomes you to our world of the finest possible audio electronic products. We thank you for your purchase and we assure you many years of musical enjoyment. We are always available to answer your questions and we welcome comments regarding our products. Feel free to contact us at any time through our website at www.dynamicsounds-assoc.com or by sending messages directly to info@dynamicsounds-assoc.com. We look forward to your feedback and will gladly respond to all questions and comments.

IMPORTANT INFORMATION

1. All units are set to operate on 120VAC ONLY unless a label is applied to the back panel under the power plug indicating 230VAC operation. Operating a unit set for 120VAC on 230VAC will cause permanent damage and void the warranty.

2. Dynamic Sounds Associates reserves the right to make changes or modifications to future units without prior announcement. Any such changes or modifications will be for the purposes of improving the mechanical or sonic performance. Dynamic Sounds Associates is under no obligation to incorporate any changes or modifications into prior units; however, it may be possible to provide upgrade packages for prior units—if desired—at a cost.

3. Registering your component with us by using the form at the conclusion of this manual, will allow us to contact you with potential product upgrade information. **Information regarding upgrades may also be requested by e-mail to info@dynamicsounds-assoc.com.**

1.0 GETTING STARTED

We know you are eager to get your new Pre I into play. This section will provide preliminary information on the features of the Pre I and familiarize you with the layout of the controls and the connectors. Section 2.0 will guide you through the process of setting up the Pre I and making the proper connections. Section 3.0 will provide additional information on the operation and use of the features of the Pre I. Section 4.0 will provide more detailed information on the overall design and capabilities of the Pre I and can be reviewed at your leisure. Section 5.0 will provide information on how to balance the outputs of the Pre I to maintain its high degree of performance. The Pre I comes pre-balanced and, during normal operation, should not require checking and adjusting the output balance more than once/year.

1.1 Unpacking

The Pre I should be carefully removed from the packaging material that it is wrapped in. The following items should also be found in the Pre I shipping container:

- Shielded power cord
- Four Model 3 VIBRAPOD Isolators
- #00 Philips screwdriver (Section 5.0)
- XLR female connector with three wires (Section 5.0)
- Plastic bag containing:
    - ¼ watt 1kOhm resistor (Section 5.2)
    - 1/16" hex key (Section 1.5)
    - 0.050" hex key (Section 3.2.2)
- Remote control (with batteries installed)

1.2 Installing the VIBRAPOD Isolators

First remove the Pre I from its plastic protective bag and then the VIBRAPOD Isolators should be screwed into the four threaded (10-32) comer holes on the bottom of the Pre I. These are provided with thumbscrews so that additional tools are not required. If desired, other feet can be used, provided they have a 10-32 screw that is not longer than ¼" so that they can be firmly attached to the bottom plate of the Pre I.

NOTE: VIBRAPOD recommends the use of playing cards, bar coasters, or felt under the isolators to prevent potential blemishes to the surface on which the Pre I is sitting.

1.3 First Look at the Pre I

After unpacking your Pre I, installing the four feet, and ensuring that all of the parts are provided, you should take a few moments to familiarize yourself with the features on the front and back panels.

1.3.1 Front Panel

The front panel is shown in **Figure 1**.

Figure 1 - Front Panel View of Pre I

The front panel is divided into three sections identified as: center, left-of-center, and right-of center. The functions located in each section are:

- Center
  - Level/Balance control knob
  - Remote control receiver below knob
  - Drop down door concealing headphone jack and Auxiliary Input

The lower portion of the center section is hinged and can be opened to reveal the Auxiliary inputs (L & R) and the headphone jack.

- Left-of-center
  - Input selection
  - Stereo/Mono operation
  - Phase – Normal/Inverted
  - Throughput gain indication

- Right-of-center
  - Digital display for the "level" of the left and right channels. These displays indicate the output "level" of each channel in dB, and each display goes from "0.0" (minimum output) to "63.5" (maximum output).
  - Buttons and indicator LEDs for the Standby, Mute, and Run modes of operation

Section 3.2 will describe these functions in greater detail

The lower portion of the front panel center section is a drop down door, behind which are located a ¼" headphone jack, the input connectors for the Auxiliary input, and an access hole for resetting the level displays, as seen in **Figure 2**.

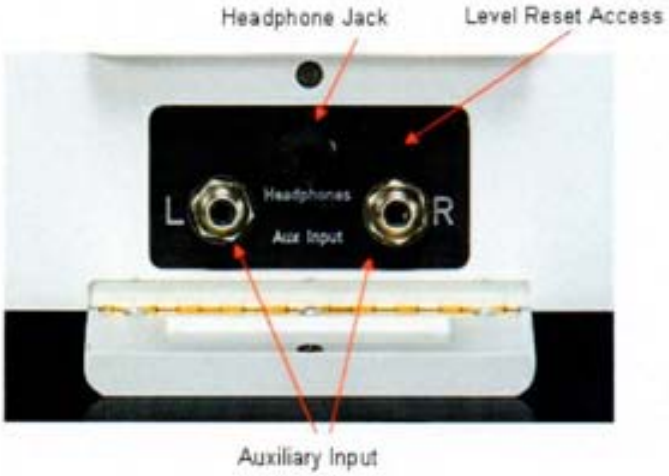

Figure 2 – View Behind Drop Down Door

1.3.2 Back Panel

A view of the Pre I back panel is shown in **Figure 3**.

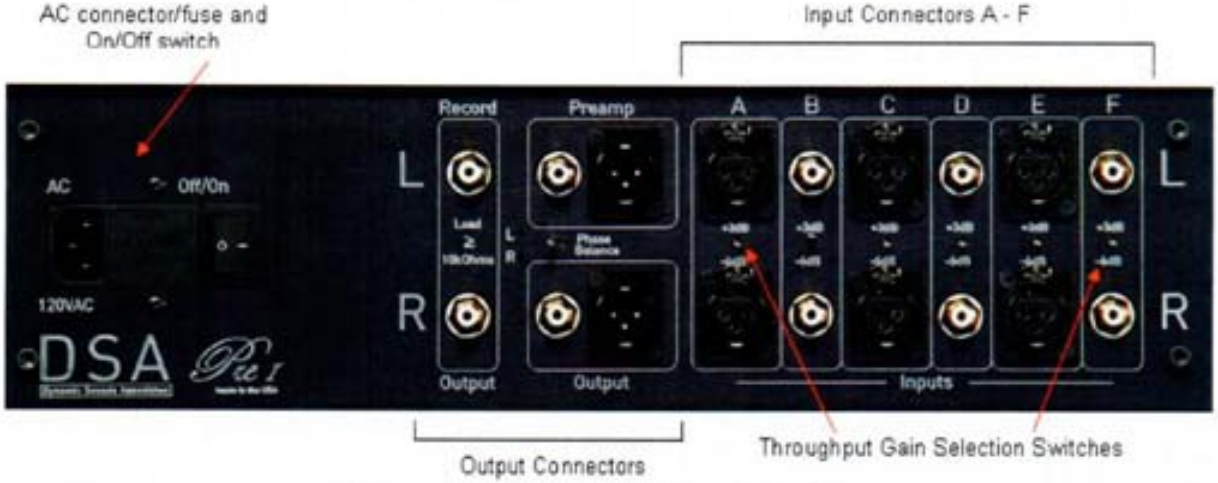

Figure 3 – Back Panel View of Pre I

The back panel contains power and audio connections. The AC power receptacle is on the left, housed in a unit that has an integral AC power switch and fuse holder that is located between the power receptacle and the switch.

NOTE: The fuse holder can only be removed when the power cord is removed from the AC receptacle. Two replacement fuses are contained within the fuse holder (see section 2.1).

- The input connectors for both channels are gathered in groups labeled Input A through Input F. (The Auxiliary input is located on the front panel.) Inputs A, C, E have balanced (XLR) input connectors, and inputs B, D, F have unbalanced (RCA) input connectors.

- Located between the rows of left and right channel inputs is a toggle switch for each input. This switch is used to select the appropriate amplifier throughput gain[1] for each input. The center position for this switch is the default selection of 12dB gain. Moving the switch to the upper position increases the gain to 15dB, and moving the switch to the lower position reduces the gain to 6dB. These switches are intended to be used to reduce the input level variations between different sources.

- The main audio output for each channel has both an RCA socket (for unbalanced output) and a male XLR socket (for balanced output). It is possible to use both output connectors, if desired, without damage to the unit.

- The record output has unbalanced (RCA) connectors only. This output is intended for use with recording devices, or other amplifiers, which have an input impedance ≥10kOhm. (Lower input impedances can be used, but the low frequency response out of the Pre I will be reduced.) Also, as shown in Figure 5, this output is independent of the Pre I output level and the phase is non-inverted (normal) with respect to the input signal.

Notes:

(1) When first turned on it takes approximately 60 sec for the main amplifier power supplies to reach operating voltage and stabilize. During this time the Standby LED will show an orange color and will blink at a 1Hz rate. **(If the Standby LED shows a red or green color only, turn off the unit and contact the manufacturer.)** The Pre I cannot be switched to the Mute or Run mode until after the power supplies have stabilized. This will be indicated when the standby LED stops blinking.

(2) When switching between the Standby and the Mute mode, there is a delay of a few seconds for the Pre I to come out of the Standby mode, and before the Mute LED will illuminate. This is due to a startup delay in the output stage for each channel.

(3) Once in the Mute mode, switching between the Mute and Run modes is instantaneous, as is the response when switching from Run to Mute.

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[1] Throughput gain defines the total amplifier gain with the level control at maximum. The level control setting will determine the actual instantaneous gain of the unit.

1.4 LED Dimmer

This function is activated using the large red button on the bottom plate. The button is located on the front-to-back center-line and about 2" behind the bottom edge of the front panel. This button can be reached by slightly lifting the front of the Pre I. The dimmer circuit provides four levels of LED intensity for all of the blue LED indicators, including the digital level displays. Each press of this button will step to the next lower intensity level and then start over as follows:

Max intensity → Reduced intensity → Low intensity → Minimum intensity → Max intensity

On power up the dimmer provides maximum LED intensity. Note that the Standby and Mute LEDs are not controlled by the dimmer function but always remain at full intensity.

1.5 Remote Control

The layout of the buttons for the Pre I remote control is shown in **Figure 4**.

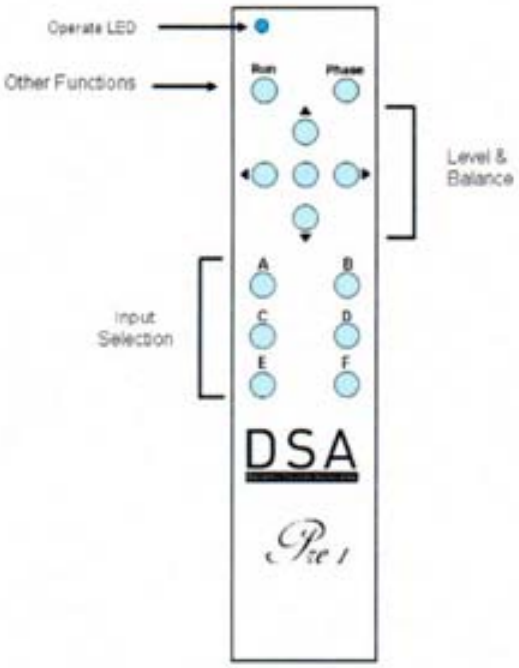

Figure 4 – Remote Control Buttons

The buttons are arranged in three groups:

- Input Selection
- Level and Balance
- Other Functions

Input Selection - The buttons for input selection are labeled "A – F" corresponding to the inputs provided on the back panel. Pressing any of the labeled buttons will select that input, and this selection can be made at any time.

Level and Balance - The buttons for level and balance function as follows:

- ▲ Increases the level of both channels. (Maximum level for either channel is 63.5dB.)
- ▼ Decreases the level of both channels. (The minimum level for either channel is 0.0dB.)

Each press of either of these two buttons will increment the level by ± 0.5dB. If either of these two button is held down, the level will increment up or down in 0.5dB steps at an approximate 5Hz rate. Releasing the button will stop the changes.

- ► Shifts the audio image to the right. Each press of this button will increase the right channel level by 0.5dB, and decrease the left channel level by 0.5dB, resulting in a 1dB balance shift to the right—but keeping the total acoustic power unchanged.
- ◄ Shifts the audio image to the left. Each press of this button will increase the left channel level by 0.5dB, and decrease the right channel level by 0.5dB, resulting in a 1dB balance shift to the left—but keeping the total acoustic power unchanged.

Continued holding down of either button (► ◄) will NOT result in a continued image shift. To continue to shift the image, the appropriate button must be pressed once for each 1dB shift that is desired. Using the up/down level buttons (▲ ▼) will result in changes in the total audio level, but maintain the selected balance offset.

The central button in this group is the Mute button, and pressing this button will mute the Pre I. This mute function operates on both the main audio output connections and the headphone output.

Other Functions - There are two "Other Functions" buttons along the top of the remote control.

- Run – This button is used to bring the Pre I out of the mute mode, or to bring the Pre I to a run condition when it is in the Standby mode of operation.

- Phase – This button is used to toggle between inverted phase and non-inverted phase of the audio signal relative to the input phase. The LEDs on the front panel associated with the Phase button will indicate whether the phase is normal or inverted.

For best performance, the remote control should be aimed at the IR receiver window located below the large central knob on the front panel. The operating range of the remote control is approximately 15 feet. The "Operate LED" will blink when any of the remote control buttons are pressed, indicating that the remote control is transmitting. If this LED fails to blink, or is weak, it is likely that the batteries require replacing. The remote control uses two AAA batteries which are accessible by removing the two hex screws on the bottom plate of the control using the provided 1/16" hex key and sliding out the battery holder. Pay attention to the polarity markings on the battery holder when replacing the batteries.

2.0 SETUP AND INSTALLATION

The setup of the Pre I consists of two steps:

(1) Connecting the cables to the desired input connectors
(2) Selecting the desired input and associated throughput gain

These steps will be addressed in the sections that follow.

2.1 Connecting the Cables

The connectors for the Right and Left Channels are grouped separately to prevent confusion and the input and output connectors are individually labeled. In accordance with convention, the Right Channel uses connectors with a Red band on them and the Left Channel uses connectors with either a White or Black band.

The choice of output connector depends on whether balanced or unbalanced output cables are to be used. If unbalanced cables are to be used, they are connected to the Left and Right channel RCA connectors, respectively. If balanced output cables are to be used, these are connected to the respective XLR output connectors.

Because the used of a balanced output connection results in a 6dB increase in signal level relative to the unbalanced output, it is not recommended that balanced and unbalanced cables be mixed when going to the same amplifier following the Pre I. However, the Pre I can drive separate amplifiers using both the balanced and unbalanced outputs, providing that the combined loading impedance does not result in total output currents exceeding 40mA. (Assuming a typical 2.0 VRMS output voltage, this corresponds to a combined load impedance $\geq$ 50 ohms.)

The AC power cord plugs into the connector on the left-hand side of the AC power module on the back panel.[2] This power module also contains the power on-off switch and two line fuses housed in the center section of the module. This module can accommodate either

[2] The supplied power cord is a shielded cord; however, users may prefer to use their own power cord having a standard IEC connector.

120VAC or 240VAC supply voltages, however they are not interchangeable without internal changes on the power supply board. Unless indicated otherwise, all Pre I units are set to perform **ONLY** on 120VAC. Connecting them to 240VAC will cause failure of the unit. Those units that are set to operate on 240VAC are so indicated by the application of a label indicating use for 240VAC on the back panel.

The fuses are accessible by removing the power cord and then prying the fuse holder out of the center portion of the AC module using a small flat blade screwdriver (not supplied). There is a slot to be used for this purpose on the edge of the module adjacent to the location of the power plug. Extra fuses are provided, and are located in small compartments that are integral to the fuse holder. These are accessible once the fuse holder is removed. Be certain to only use replacement fuses that are of the 20 mm size, and 1.5 amp capacities such as the Buss Type GMC fuse.

2.2 Selecting the Desired Input and Setting the Gain

Selection of the desired input is achieved using either the buttons on the front panel, or the appropriately labeled buttons on the remote control. The Auxiliary Input, located on the front panel behind the drop down door, can only be selected by the Aux Input button on the front panel. Input selection can be made at any time during the operation of the Pre I, including the run mode.

Table 1 lists the suggested settings for the throughput gain switches on the back panel based on a requirement for 2.0 VRMS at the main audio output, and the level set at maximum (63.5dB). These settings are only suggestions and the user should experiment with other settings to ensure that the desired listening levels can be achieved without excessive level adjustment when switching between inputs.

During operation, the gain LEDs on the left-hand side of the front panel will indicate the throughput gain for the selected input.

TABLE 1

Input Level (VRMS)	Throughput Gain		
	6dB	12dB)	15dB
< 0.2			X
0.2 – 1.0		X	
> 1.0	X		

3.0 OPERATION OF THE PRE I

The Pre I should be placed on a sturdy shelf that will provide adequate support for the unit and permit access to the back panel for cable connections. Clearance at the ends of the unit should be at least 1 inch, and the top panel clearance should be at least 2-3 inches to permit adequate air circulation for cooling.

3.1 Turning on the Pre I

After connecting the input and output cables and inserting the power cord into the AC module, the Pre I can be turned on using the power switch on the AC module on the back panel. When turned on, the Standby LED on the right-hand side of the front panel will glow with an orange color and will blink at approximately a 1Hz rate. This blinking will continue for about 60 sec during which time the voltages on the internal amplifier cards are ramping up to their operating values. Until this LED has stopped blinking, indicating that the amplifier operating voltages have been reached, selecting either Mute or Run will have no effect.

NOTE: If this LED shows either a red or a green color only, it indicates that one of the power supplies is not active. Turn the unit off and contact the manufacturer for instructions.

After about 60 sec the power supplies will have reached their final values and the Standby LED will stop blinking, then the Mute position can be selected by pressing the Mute button on the front panel, or on the remote control. When moving from Standby to Mute, there will be a 4-6 second delay while the output stage voltages are applied and before the Mute LED will show a light green color. You may observe that the Standby LED will show either a brief green or red color prior to the Mute LED showing a light green color. This is perfectly normal and does not indicate any problems with the Pre I. In "Mute," the Pre I is fully powered, but the muting relays on the output are open.

NOTE: In both the Standby and Mute modes the digital display for the output level will show "—" for each digit, and neither the level control knob on the front panel or the level or balance buttons on the remote control is functional.

Switching to "Run" using either the Run button on the front panel or the "Run" button on the remote control closes the output muting relays[3]. In the run mode, the Run LED will show a blue color and the digital level display will show the digits representing the selected output level for each channel. (If starting from AC turn-on, the display digits will only show "0.0" when selecting the run mode. The 10's digit will illuminate as the level is increased such that the level is $\geq$ 10dB.)

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[3] The "Mute" button on the remote control is NOT a toggled function. Pressing the mute button again after entering mute will not switch to the run mode. This can only be done using the "Run" button on the remote control.

There is no delay between selecting the Run mode and the Run LED turning blue. Switching back to Mute from Run will turn off the Run LED and illuminate the Mute LED again. Switching back to the Standby mode turns off the output stage voltages but not the amplifier board voltages so the Standby LED will glow but will not blink.

NOTE: If desired, either the Mute or Run button may be pressed during the initial 60 sec period after AC power on. If this is done, then once the Standby LED has stopped blinking the Pre I will advance directly to the operating mode that was selected. However, if "Run" was selected there will still be the additional 4-6 second delay while the output stage is powered up.

Once operational the Pre I should be left in the Mute or Run mode for about two hours to reach thermal equilibrium. While it can be used and enjoyed during this warm-up period, there is the potential for small DC voltages to appear at the output connectors and some of the switched functions—if activated—may cause unwanted "pops or thumps" in your speaker system. These will be greatly reduced after the Pre I has fully warmed up and thermally stabilized, at which point the top panel should be slightly warm to the touch. For those who wish to listen on a regular basis, it is advised that the Pre I be left running in the Mute mode since this will maintain the thermal equilibrium condition.

3.2 Front Panel Functions

3.2.1 Front Panel Left-Hand Side

Input: The buttons, labeled "A – F" and "Aux Input" are used to select the desired input. Inputs "A - F" are located on the back panel of the Pre I and the Auxiliary Input is located on the front panel behind the drop down door in the center section. Inputs "A – F" can also be selected from the labeled buttons located on the remote control. Input selection can be made at any time during Pre I operation from either the front panel buttons or the remote control.

Mode: This button toggles between stereo and monophonic operation. In the Stereo mode, the Pre I is a true stereo preamplifier with > 60db channel separation. In the Mono mode, the left and right channels are summed to provide a true mono mode (the identical signal applied to both channels). The mono mode works best with mono source material but can also be used with stereo source material if desired.

Phase: This button selects either normal (non-inverted) or inverted absolute phase of the output signal relative to the phase of the input signal. The default condition is normal phase from the input to either the unbalanced output or the positive side of the balanced output. Pressing the button toggles between normal and inverting operation. This function can be used with the Pre I in either the mono or stereo mode. The "Phase" button on the remote control can be used to perform the identical function described above. Having this

function on the remote control permits the listener to toggle between these two options while in a preferred listening position.[4]

3.2.2 Front Panel Center

Level/Balance knob: This knob controls both the output level of the Pre I—as indicated by the digital displays—and the balance between the left and right channels. Normal clockwise (CW) rotation of the knob will increase the output level and counter-clockwise (CCW) rotation will decrease the output level. During rotation slight "detents" will be felt and each such step will change the level in both channels by ± 0.5dB depending on the direction of rotation.

The level can also be increased (▲) or decreased (▼) by a single press of the appropriate buttons on the remote control. If the ▲or ▼ buttons on the remote control are held down, then the level will step up or down, respectively, in 0.5dB increments at an approximate 5Hz rate.

NOTE: If either or both digital displays show "0.0" then CCW rotation of the knob will have no effect on the level. Likewise, if either or both channel displays show "63.5", then CW rotation of the knob will have no effect on the level. This also holds true when using the remote control—the level of either channel cannot be less than "0.0", or greater than "63.5."

Balance adjustments are made by pressing the knob inward (a slight detent will be felt) and turning it CW to shift the acoustical image toward the right, or CCW to shift the image toward the left. It will be noted that when changing the balance in either direction, one channel will be incremented up in level while the other channel is incremented down by the same amount. Thus, while the acoustical image location can be shifted, the total level of the sound is unchanged.

When operating as a balance control, the knob operates at ½ the rate that it does when adjusting the level. Thus, it requires two detent steps to change the balance by 1dB in either direction (± 0.5dB on each channel). This is to prevent excessively rapid changes in the balance which can be confusing to the listener.

Once the desired balance has been set, using the knob or remote control to adjust the overall level up or down will cause each channel to increment up or down—as directed—by the same amount. Thus, the balance can be set independently of the overall level.

NOTE: While the level controls for each channel have been designed to track together, in rare instances they may get out of sync and cannot be brought back in sync using the balance adjustment. If this occurs, the levels can be reset to the "0.0"

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[4] The phase of the Record Output is not changed by using the Phase button on the Pre I or on the remote control.

condition by using the provided 0.050" hex key and inserting it into the small hole located behind the drop down door to the right of the headphone jack. (See Figure 2.) Inserting the long end of the key completely and pressing momentarily (a slight detent will be felt) will reset the level controls for the two channels. The 0.050" hex key is provided for this purpose and is preferred to the use of a paper clip or other thin wire.

4.0 DESIGN PHILOSOPHY AND IMPLEMENTATION

The solitary goal of the Dynamic Sounds Associates (DSA) Pre I is to provide amplification of the selected source material without compromising the source in any way. To achieve this goal, the Pre I is based on a "no-compromise" dual channel design using best engineering principles and the finest of components. The Pre I does not employ any form of loop or global feedback to achieve the desired throughput gain. Instead, each gain stage of the Pre I has internal feedback to ensure that all forms of distortion are held to very low levels, and that each stage has a dynamic range capability that greatly exceeds that of the source material. It also eliminates transient inter-modulation distortion, which is a common byproduct of configurations where the throughput gain is achieved through the use of intra-stage loop feedback.

4.1 Amplifier Chain

The block design of the Pre I is shown in **Figure 5**. It consists of three fully differential all FET gain stages and each gain stage employs its own precision, temperature compensated, constant current source and voltage regulator for the ultimate in stability, signal control, and isolation.

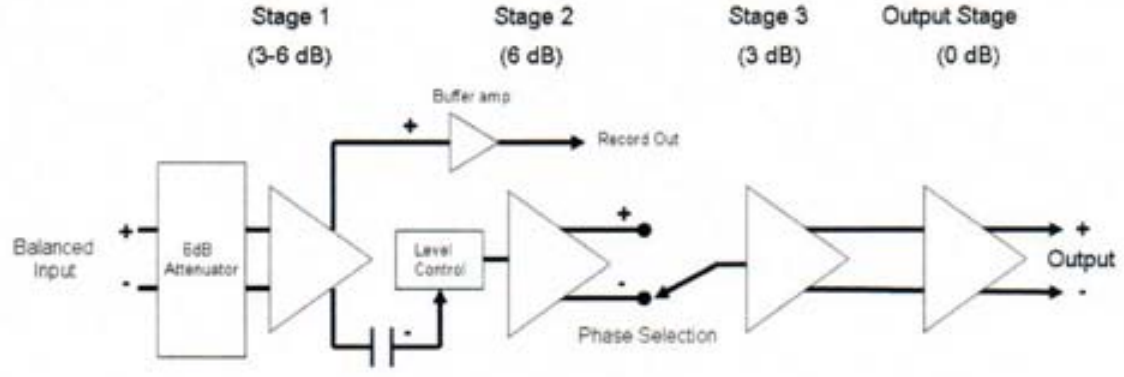

Figure 5 – Block Diagram of Pre I

As can be seen from **Figure 5**, the input to the Pre I is fully balanced. When using an input that is unbalanced, the negative side of the balanced input is grounded to prevent it from adding interference. The precision 6dB attenuator at the input is based on a "T-pad" constant impedance design and is active on both the positive and negative sides of the

input. This attenuator is used to reduce the throughput gain by 6dB, if required. The additional 3dB of throughput gain, when required, is derived by changing the internal feedback in the first gain stage. The non-inverting differential output from the first stage goes to the record output through a unity gain buffer amp, and the inverting output is passed to the level control. Phase selection uses the differential outputs from the second stage, and the appropriate one is selected based on the desire for non-inverting or inverting phase.

The design of the Pre I uses a single high quality film and pure tin foil coupling capacitor at the input to the level control. While DSA dislikes the use of any coupling capacitors within the audio chain, this was required to prevent the DC voltage at the output of the first stage from causing a DC voltage at the output of the unit that varied with level control setting. If such a signal were fed into a DC coupled power amplifier, it would result in a displacement of the speaker cones with level setting.

4.2 Level Control

The Pre I uses a very unique design for the level control. To preserve the very high dynamic range and low distortion that was inherent in the basic design, it was necessary to have a level control that was not only very precise (since the minimum step was 0.5dB) but that maintained a constant impedance regardless of setting. In addition it had to have an adjustment range that was > 60dB, while having the minimum number of resistive components in the actual audio chain. To achieve these goals a 7-bit digitally controlled attenuator design, based on the use of precision T-pads or Pi-pads was developed. The use of T-pads or Pi-pads provided the constant impedance aspect, as well as the necessary precision for each attenuator step. Since the digital control was to be based on a binary up/down counter configuration, the seven individual attenuator steps are: 0.5dB, 1.0dB, 2.0dB, 4.0dB, 8.0dB, 16dB, and 32dB. Each step is accurate to within 1% of the step value. These values enabled a range of 0dB to 63.5dB of attenuation which was judged to be sufficient. All of the steps were designed using Pi-pad configurations since they have only a single resistive element in series, except for the 0.5dB and 32dB step which use T-pad configurations and two series resistors each. This was required because of the unreasonably high resistive values required to implement these two steps in a Pi-pad configuration.

The level control operates using the attenuator steps in series and are either switched into the circuit to provide attenuation, or removed completely and replaced by a short circuit. This switching is performed using high quality DPDT reed relays selected for very low contact resistance and low bounce time when operating. At maximum attenuation (digital display = 0.0dB) all of the attenuator steps are engaged. As the level is increased, attenuator steps are removed from the circuit and replaced with short circuits until all steps are removed for maximum output (digital display = 63.5 dB). The result is that, in the mid range of the level control only a few attenuator steps are actually being used, which meets the additional goal of having only a few resistive elements in series with the audio chain.

4.3 Output Stage

The Pre I uses a separate high bias current Class A output stage for each polarity of the amplified audio signal. The output stage supply voltages are fully regulated and are powered separately from the voltage rails that power the amplifier chain of the Pre I. The output impedance for each polarity at the output connectors is 75 ohms.

Because of the high rail voltages, and the inherent linearity of the Pre I design, it is capable of providing an output drive voltage $\geq$ 40 volts peak-to-peak without any clipping of the audio signal. The output stages of the Pre I can provide up to 40mA of drive current without distortion, and can drive amplifiers with input impedance as low as 50 Ohms, or long cable runs that have a capacitance of greater than 30nF, without any problems[5].

4.4 Power Supply

The Pre I employs a dual, fully regulated power supply, and the individual supplies are isolated from each other. The power supply for each channel provides ± 65V rail voltages for the operation of the amplifier section as well as separate rail voltages of ± 47V for the associated output stage. In addition, it also generates regulated ±12VDC for internal use by the regulator, and +5VDC that is used to control the front panel functions.

The Pre I power supply is designed with an approximate 60 sec ramp from about ±5VDC at turn-on to the full ±65VDC. As the voltage slowly increases, the value of both positive and negative rails are monitored by comparison circuitry in the power supply. Only when both rails have achieved the proper final values of ±65VDC, and the regulator section has "clamped" indicating that it is in the fully regulated mode, is a turn-on signal generated that permits the output stage to be turned on when the "Mute" or "Run" button is pressed. In a similar manner, the voltage rails for the output stage are monitored to ensure that they are correct before the "Run" function can be enabled. This prevents operation in the event of a failure within the power supply or amplifier board that could result in applying a large DC bias to the output connectors.

The Pre I uses two matched shielded toroidal transformers, whose primaries are driven out of phase from each other. These transformers are also encased in a separate magnetically shielded housing to provide virtually total cancellation of residual AC fields within the Pre I chassis. In addition, the Pre I has an internal RFI filter on the AC power line to eliminate residual power line interference that might enter via that pathway.

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[5] This is based on a 20kHz signal at 40V p-p. At lower frequencies or drive levels, the Pre I can drive significantly higher values of capacitance without difficulty.

5.0 BALANCING AND OTHER ADJUSTMENTS

Since the Pre I is DC coupled following the level control, there is the potential for DC drifts and offsets to appear at the output as a result of thermal drifts and ageing of components. However, due to the stability of the design, and since the maximum gain of the last two amplifier stages is only 9dB, these drifts are expected to be minimal once the unit is balanced. The Pre I comes from the vendor fully "broken in" and balanced under normal thermal operating conditions. Testing has shown that the circuitry of the Pre I is stable for over a year and that additional balancing is generally not required. However, through long periods of use, or use in extreme thermal environments, some rebalancing may be required. The need for such adjustment will become apparent when use of the phase function, or changing between mute and run, results in an excessive "thump." (A small "pop" may occur and is a normal occurrence when selecting the Pre I output and does not indicate a problem. If this is a concern, DSA recommends turning on the power amplifier after the Pre I is in the Run mode.)

The location of the balance adjustments is shown in **Figure 6**. These adjustments should be made with the top cover in place because removing the cover will change the thermal equilibrium conditions.

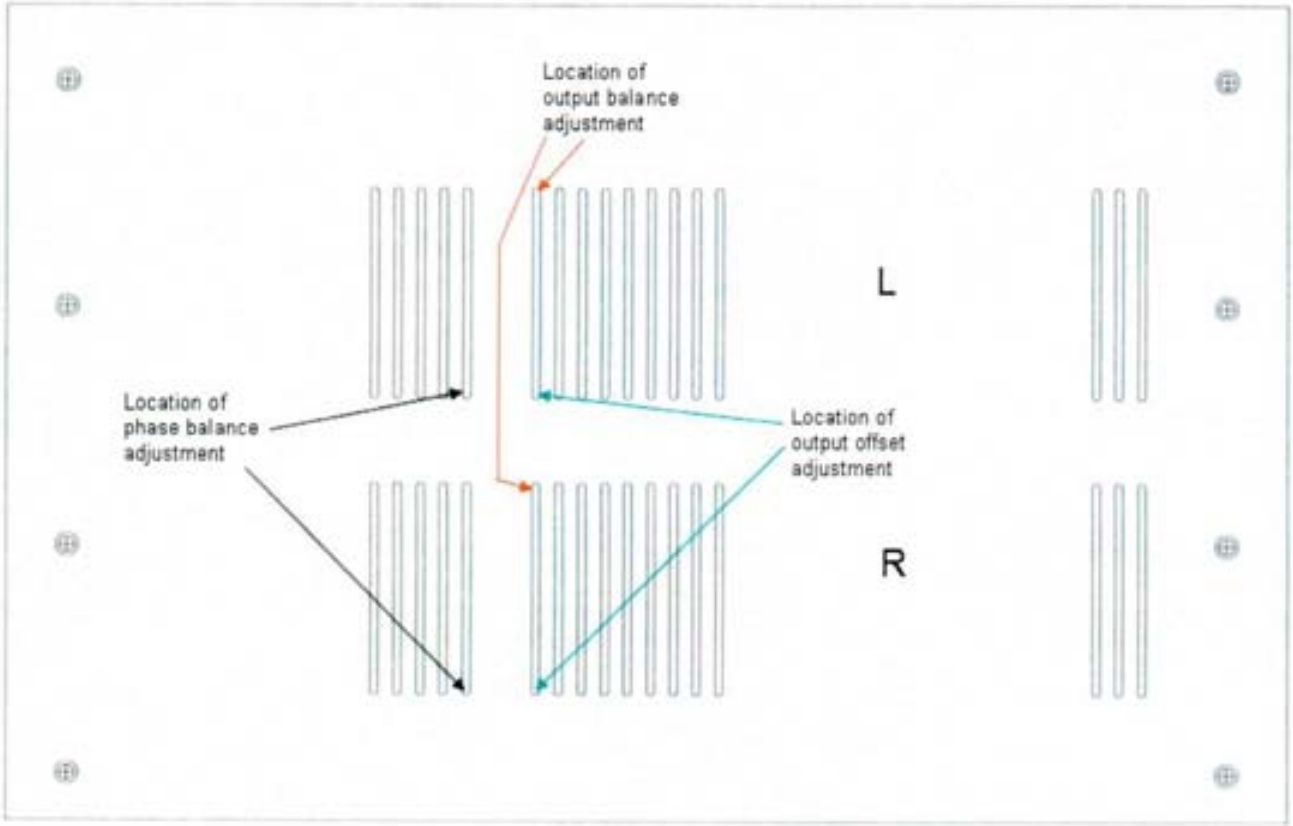

Figure 6 - Location of Balancing Adjustments on Top Panel

The adjustments described below should be made with the Pre I on and fully operational. To ensure thermal stability, it should be left in "Mute" mode for several hours prior to making these adjustments. If, for any reason you do not wish to make these adjustments yourself, the unit may be returned to DSA for these adjustments. During the first year of warranty service, these adjustments, if required, will be made free of charge. See Warranty for more details.

5.1 Excessive "Pop Noise" When Going Between Run and Mute

This situation implies that the DC balance, and/or offset, at the outputs have drifted out of the factory specification. This adjustment uses the #00 Philips head screwdriver and female XLR plug with three wires that are provided with the unit. Also, a DC voltmeter is required, but this is not provided.

After a period of warm-up to ensure thermal equilibrium, insert the female XLR plug into the left channel XLR output socket. Using the DC voltmeter, measure the voltage between the red and blue wires; the voltage should be less than ±10mV. If it is greater, insert the screwdriver through the top panel slot where indicated for the left channel output balance adjustment (see Figure 6 above). The screwdriver will engage a small adjustment potentiometer that is below the indicated location (a small flashlight may be needed to see the control below). Once engaged, rotate the screwdriver very slightly to obtain "0 volts" (typically ± 10mV) between the two wires.

Once this balance has been achieved, connect the voltmeter between the black wire and the red wire. Insert the screwdriver in the bottom of the same slot where the output offset adjustment potentiometer is located (see Figure 6 above). Using the screwdriver, adjust the control in a similar manner to obtain a reading of "0 volts" (typically ± 10mV) on the voltmeter. You have now balanced the output of the left channel.

Repeat the above process for the right channel, first moving the female XLR plug to the right channel output socket.

5.2 Excessive "Pop Noise" When Changing Phase

This adjustment is rarely required; however, if required, the phase balance function is activated using the small toggle switch on the back panel located between the two sets of output connectors, as shown in **Figure 7**. Moving this switch to the right, toward the "Phase Balance" text, will enable the phase balance to be performed. (In the normal mode of operation this switch should be to the left, which disables the phase balance function.)

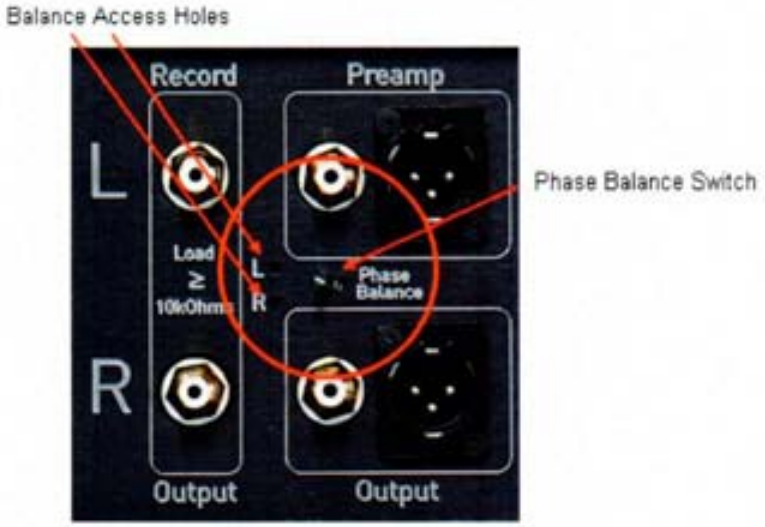

Figure 7 – Location of switch and holes for phase balance

To the left of this switch are two small holes labeled "L" and "R". There is a socket located behind these holes and the provided 1kOhm resistor will plug into the socket. (When the lead goes into the socket there will be some slight resistance and then the lead will slide in.)

First plug in the XRL female connector used in section 5.1 into the right channel XLR output socket. Then, find the 1 kOhm resistor provided with the unit and insert the short end into the upper ("L") of the two holes shown in **Figure 7**. (When properly engaged in the socket, the outer end of the body of the 1kOhm resistor will be almost flush with the outside surface of the back panel.)

After a sufficient period of warm-up, connect a DC voltmeter between the protruding resistor lead and the black lead on the female XLR plug. Measure the voltage and then press the front panel phase button to invert the phase, and measure the voltage again. The two readings should be within ±10mV of each other. If not, insert the provided screwdriver through the top panel slot in the location indicated in **Figure 6** for the left channel phase balance adjustment.

As in section 5.1, adjust the phase balance potentiometer such that the voltages in the normal and inverted phase positions are within ±10mV. (This typically requires switching back and forth between the two phases several times in order to get the voltage for each phase within the desired ± 10mV.) Then remove the resistor and place it in the lower ("R") hole, again engaging the socket behind the hole. Repeat the voltage measurement between the protruding resistor lead and the black wire on the female XLR plug and adjust the phase balance potentiometer for the right channel as before.

When these adjustments are completed, remove the resistor and the XLR connector and return the phase balance switch to the "off" position (to the left). This completes the balancing adjustments that may be required occasionally.

6.0 SPECIFICATIONS

Design Topology:	
Gain stages:	**Balanced-differential**
Output Stage:	**Class-A, balanced-differential, push-pull**
AC Voltage:	**120 VAC (240VAC option)**
Fuse Type and Rating:	**2 x Buss GMC (20 mm) 1.5 A**
Dimensions:	**17" (W) x 11-1/2" (D) x 4-1/2" (H)**
Weight:	**22 lbs**
Input Impedance:	**20k ohm**
Throughput Gain (at 63.5dB level setting):	**User selectable: 6dB, 12dB, 15dB**
Frequency Response (Output 6V P-P @ 1kHz, Level = 63.5dB)	
+0dB, - 0.5dB	**6 Hz – 100 kHz**
+0dB, - 3dB	**3 Hz – 400 kHz**
Channel Separation:	**≥ 60 dB**
THD @ 1kHz	**See typical measured results in Appendix A**
Max Output Voltage (THD ≤ 2%):	**≥ 40 volts peak-to-peak (14VRMS)**
Output Impedance (balanced or unbalanced):	**75 ohms**
Output Current:	**Max. 40 mA (for Class A operation)**

WARRANTY

All DSA products carry a three (3) year warranty against defects in material, components, and workmanship. This warranty also includes the balance adjustments described in Section 5.0, if required, during the first year of service. This warranty becomes effective on the date of purchase, or the date of shipping, which ever is later. To ensure proper registration of the product, and to validate the warranty, it is necessary to return the warranty registration card below. (This card may be scanned and e-mailed to info@dynamicsounds-assoc.com if preferred.) Under the terms of the warranty, repairs and/or adjustments will be made at manufacturer's cost, including return shipping to the user during the warranty period. The user is responsible for shipping costs to the manufacturer for warranty repairs. Charges for unauthorized service and shipping are not covered under this warranty. This warranty is null and void where it is apparent that misuse, accident, neglect, and tampering with or modifications by other than DSA have damaged the product. The warrantor assumes no liability for property damage or any other incidental or consequential damage whatsoever which may result from a failure or misuse of this product.

Prior to returning any product for warranty repairs, or adjustments, it is necessary to obtain a return authorization number (RAN). Products returned without a RAN will be returned without repair, or adjustment. You must obtain an RAN by sending an e-mail to support@dynamicsounds-assoc.com. Identify the product, the serial number and provide a brief description of the problem with the product. You will receive an RAN by return e-mail message.

DETACH THIS PORTION AND SEND TO DSA TO COMPLETE REGISTRATION

Dynamic Sounds Associates
1754 Persimmon Ct.
Naples, FL 34109

MODEL_____ SERIAL No. _____

PURCHASE/SHIPPING DATE _____

NAME OF OWNER _____

ADDRESS _____

CITY, STATE, COUNTRY, ZIP _____

TELEPHONE No. _____

E-MAIL _____

APPENDIX A

Total Harmonic Distortion (THD) measured @ 1 kHz