Threshold model SL10 "straight-line", direct coupled cascode/class A preamplifier operating manual

CONTENTS

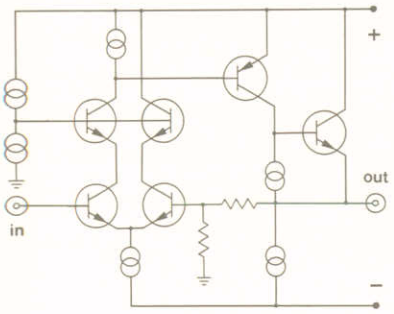
IMPORTANT

Please complete the product registration card accompanying your new Threshold SL10 preamplifier and return it to Threshold Corporation. This card is supplied with the required domestic postage at time of shipment for your convenience.

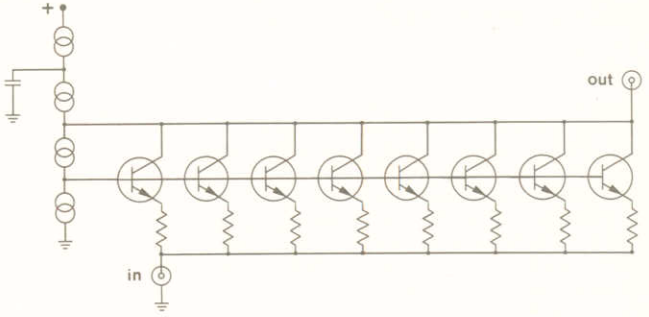
It is Threshold policy to make any subsequent modifications, which may be applicable to previously manufactured products, available on a priority basis only to units which have been registered by return of their product registration card within ten days of purchase.

If you did not receive a product registration card with your Threshold SL10 preamplifier you cannot be assured of having received a new unit.

If this is the case, please contact Threshold Corporation.



CONCEPTUAL SCHEMATIC
SL 10 GAIN STAGE CONFIGURATION
SINGLE CHANNEL

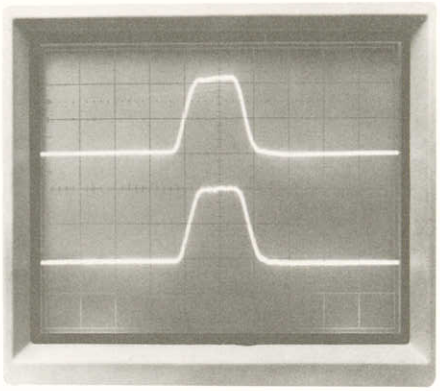


CONCEPTUAL SCHEMATIC
PRELIMINARY PHONO GAIN STAGE
SINGLE CHANNEL

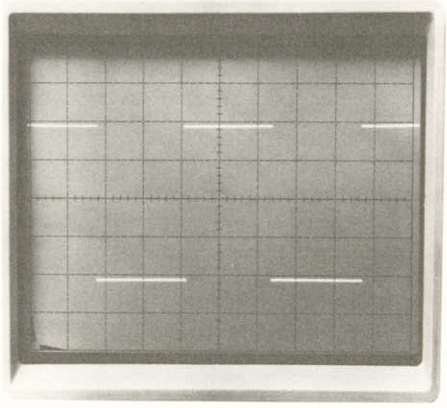
INTRODUCTION

The Threshold SL10 preamplifier that you have selected for your sound system represents fresh design concepts and empirical performance that set new boundries for the classification "state-of-the-art." No expense has been spared in its engineering or construction to assure that its extraordinary capabilities will remain virtually unchanged over years of rigorous usage.

The Threshold SL10 is a "no frills" design employing a separate power supply, capacitive regulation of 20,000 microfarads, and follows Threshold's philosophy of keeping the signal processing circuitry as simple as possible. Only two common emitter transistors are used in low and high level gain stages of each channel. Other components are there simply to assure that these two transistors remain at maximum linearity substantially beyond the range traversed by the dymanics of the audio signal. *All* transistors used in the SL10 are individually curve traced on sophisticated Tektronix equipment to assure uniformly high gain and linearity characteristics, while those transistors actually in the signal path are further selected for an ultra-low noise component.



The extraordinary speed of the SL10 basic circuit is revealed in the input vs output pulse burst display above. Shown is the SL10 basic circuit responding to a 200 nanosecond pulse burst. The upper trace is the input pulse of a 100 millivolt peak burst. The lower trace is the output of the SL10 basic circuit, driven from a 50 ohm source, reproducing the burst at a 2 volt peak output. The display is calibrated to 100 nanoseconds per division (1 microsecond across the screen). Note the extreme similarity of the two traces at this extended performance level.



The superiority of DC response capability is clearly illustrated in the oscilloscope display above. Shown is the performance of the SL10 basic circuit reproducing a one-half Hertz square wave. Note the total absence of sag and, thereby, the capability for unencumbered low frequency performance.

Your Threshold SL10 derives its model designation from its "straight-line" format and the unprecedented propagation capability of its active circuitry — ten nanoseconds. For example: a one megahertz square wave applied to the input of the basic gain circuit will appear at the output of the circuit virtually unaltered except for an approximate time delay of ten nanoseconds. With circuit speed having 150 volts per microsecond slew capability and unprecedented transit time, the SL10 assures that within the broadest definition of "audio range," transient and phase anomalies simply do not exist. The circuit capabilities of the SL10 retain constituents of a complex high frequency waveform within a time coherency far beyond the resolution capability of the human ear. Signal integrity is further assured through dc coupled design; the only capacitors appearing in the signal path are the individually calibrated polystyrene and tantalum devices used to obtain RIAA equalization. The extreme bandwidth, high speed propagation, and dc capability of the SL10 circuitry assures that the high and low frequency rolloff of the system as a whole consists of those passive losses caused by cable and input capacitances and not by undesirable limitations in the action of the amplifying circuits themselves.

Input transistors of the SL10 phono and high level circuits are operated in the cascode mode, which increases the bandwidth through a reduction of "Miller" capacitances and further isolates interaction between the source, the power supply, and the gain circuitry.

Your Threshold SL10 is designed to directly accept *all* velocity characteristic phono cartridges, whether "high" output moving magnet or "low" output moving coil designs. This is achieved through integration of an extremely sensitive "pre-preamp" section into the SL10. Not a transformer, the SL10 preliminary phono gain circuitry circumvents the performance limitations inherent in these devices to attain extremely wide bandwidth, very low noise, extraordinary definition and high rejection of rf interference. The SL10 preliminary phono gain stage consists of eight parallel transistors per channel, *directly coupled to the input and operated without feedback,* that form an active impedance matching circuit where the gain factor is the ratio of the sum of the cartridge and input impedance to the output impedance of the stage. In this way, the active synthesis of a transformer is created while avoiding the reactance effects that limit transformer operation. This circuit is a system of such accuracy that it does not require frequency compensation or corrective feedback and therefore maintains extremely high levels of speed and phase integrity.

A new level of signal resolution capability for the SL10 has been achieved through "front end" cascoding and biasing the active input devices to current levels an order of magnitude beyond those normally applied to solid state preamplifiers, particularly those reaching for the lowest possible "noise" figures. These very large bias currents substantially reduce the distortions in the gain transistors, yielding a "super class A" operating mode where the idling currents are many times larger than the current called for in actual operation. In addition to high linearity, the large bias increases the phono input transistor overload to approximately *2.5 volts,* measured at 20,000 Hz, for the high impedance phono input and greater than *1.5 milliamperes* at any frequency for the low impedance, preliminary gain stage, phono input.

Biasing the input transistors to those levels realized in the SL10, however, create undesirable voltage and offset characteristics which impede the application of such parameters in a dc coupled system. To achieve the SL10 design goal of completely dc coupled operation in the phono and high level stages, it was necessary for Threshold to develop a unique offset nulling circuit that would assure absolutely stable dc performance under all conditions. In the conventional approach to dc coupled design, input circuitry is optimized to the overriding requirement of low offset voltage in order to avoid the cascading dc amplification of voltage and bias currents which result in severe driver offset or even damaged woofer assemblies. Unfortunately, to optimize for this single parameter in the high speed circuitry of the SL10 would have compromised the system's performance as an ac amplifier of maximum resolution. In order to realize both the benefit of dc coupled design and the linearity of ultra-high bias levels, the Threshold SL10 maintains low offset voltages through a specialized circuit external to the signal processing path. This peripheral control system watches for the presence of dc offset through the signal carrying circuits and nulls it to "0" at the preamplifier output over a time span outside the region of the broadest definition of subsonic information. The action of this null circuit even includes effective cancellation of offset originating in associated equipment connected to the input of the SL10. As a result, the SL10 exhibits the dc stability of a capacitively coupled feedback loop but without the use of coupling capacitors anywhere in the audio path, thereby eliminating their attendant distortion and phase shift.

Your Threshold SL10 is a discrete design employing components of the highest grade. Dale and Corning metal film resistors are used throughout. All connectors, circuit paths and switch contacts are gold plated. Audio level is controlled through a Waters conductive plastic dual potentiometer which is environmentally sealed, as are all rotating switches, and is aligned for 1dB tracking between segments. Power for the SL10 originates with a separate power supply module utilizing Mallory computer grade capacitors. There is a total of 20,000 microfarads capacitive regulation exhibited within the supply circuitry. Quadruple decoupling, consisting of 14 electrolytics and monolythics in parallel, provides isolation equivalent to a separate power supply for each stage. Absolutely no interaction between gain stages or channels is allowed to occur through this elaborate power source system. Relay control circuitry watches for precise power supply regulation and instantaneously shorts the SL10 outputs to ground in the event power fluctuates, preventing surges from entering other components of the system.

Your Threshold SL10 is an edge-of-the-art component that will provide uncompromised performance when coupled with associated equipment of the highest calibre. The audio path is so simple, so distortion free, and so extraordinarily fast that it is incapable of sonically altering any signal passed through it which is in the range of human perception. Your SL10 fully justifies the Threshold claim to design concepts that constitute the leading edge of the art.

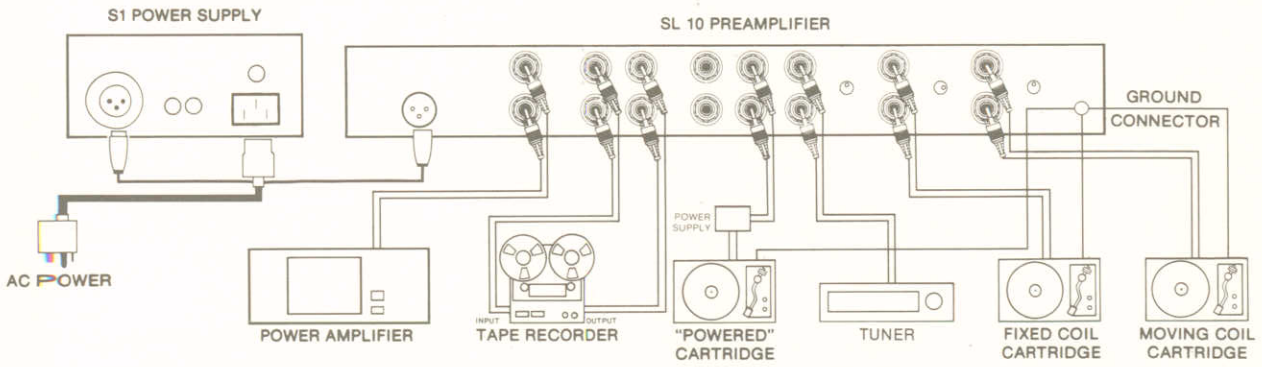


FIGURE 1 INTERCONNECTION DIAGRAM

INSTALLATION IN BRIEF

This section is designed to allow you to get your Threshold SL10 installed and operating as quickly and with as little trouble as possible. However, you should read the remainder of this manual before extensively utilizing your SL10 so that any problems from incorrect assumptions may be avoided and you are able to creatively utilize the features of your SL10 to their full potential.

If you experience any difficulties in set-up or operation of your SL10 please turn to the appropriate portion of the OPERATION section of this manual. The step-by-step explanations and functional outlines will provide the necessary information to proceed correctly and eliminate problems.

1 Your Threshold SL10 is comprised of two elements: the power module and the audio module. Place the SL10 audio module as near its final installation position as possible while allowing yourself access to its rear panel connectors. The power module should be located *away* from the audio module; place it in a position that will allow convenient connection to both an AC power source and the SL10 audio module. Make certain that associated equipment, PARTICULARLY THE AMPLIFIER, is turned off, that the AUDIO LEVEL control of the SL10 is rotated fully *counterclockwise* for minimum output, and that the audio module is not yet connected to the power module. DO NOT POSITION THE AUDIO MODULE OF YOUR SL10 NEAR ANY EQUIPMENT WHICH MAY GENERATE MAGNETIC FIELDS SUCH AS AN AMPLIFIER, TURNTABLE, OR THE POWER MODULE.

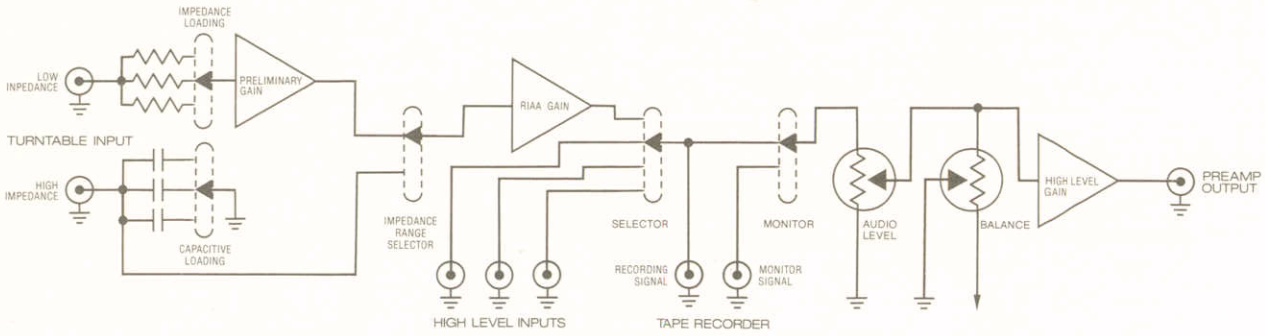


FIGURE 2. SEQUENTIAL BLOCK DIAGRAM

2 The *upper* row of connectors on the back panel of the SL10 audio module are those for LEFT CHANNEL information, the *lower* connectors are for RIGHT CHANNEL information. Follow the connection diagram for the associated equipment used with the SL10 as shown in figure 1. The identifying titles on the preamplifier cover describe the type of signal the connectors should carry. Be sure your "magnetic" (velocity characteristic) cartridge is connected to the correct high or low impedance TURNTABLE INPUT and that the applicable load matching switches are in the appropriate positions. These switches are located on the rear panel adjacent to the two TURNTABLE INPUT pairs.

BE CERTAIN THAT YOUR SL10 AUDIO LEVEL CONTROL IS AT MINIMUM (FULLY COUNTERCLOCKWISE) OR THAT THE ASSOCIATED AMPLIFIER HAS BEEN TURNED OFF FOR AT LEAST 60 SECONDS BEFORE MOVING *ANY* OF THE THREE CARTRIDGE LOADING SWITCHES. FAILURE TO OBSERVE THIS CAUTION WILL CAUSE AMPLIFICATION OF A HEAVY SWITCHING TRANSIENT TO POTENTIALLY DAMAGING LEVELS.

A block diagram of your SL10 is shown in figure 2 to assist you in understanding the sequence of its functions.

3 Attach the power transfer cable between the power module and SL10 audio module by inserting the appropriate Cannon plug on the end of the cable into the OPERATING POWER connector on each module. Insert each plug into the connector until it "clicks" into a locked mode. Insert the power cord *firmly* into the POWER SOURCE connector on the power module and then connect it to an appropriate power source. The power requirements for your SL10 are specified on the serial number plate located on the back panel of the power module. As soon as the power module is connected to a power source the attached audio module will be ON. A precision DIP relay in the audio module prevents information from appearing at the preamplifier outputs until all circuits achieve operational bias levels. Allow 60 seconds for this regulation to be attained then turn on the associated amplifier, select a program source and advance the AUDIO LEVEL control until the desired loudness is reached. Balance the sound for proper location in the stereo field by trimming with the BALANCE control if this is necessary.

OPERATION

This section will be divided into four parts. The first will discuss the selection of the SL10 location. The second and third will deal with power source and signal connections required prior to operation and will include characteristics of the cartridge loading controls. The fourth will discuss the front panel operating controls and functions.

1. LOCATION SELECTION

The principal consideration in selecting the location for your Threshold SL10 is proximity to magnetic fields such as those produced by the large transformers of amplifier power supplies, some direct drive turntable electronics, or the power module of the SL10 itself.

Even though the SL10 incorporates internal shielding far beyond the norm, its extremely high gain, ultra low level phono stages make it prudent not to tempt fate by placing the audio module with its low level section (the left side of the preamplifier when viewed from the front) adjacent to your power amplifier, turntable, or the power module.

Spacing the SL10 at least two feet away from AC power cords or its power module and three feet or more away from equipment using large power supplies should eliminate any hum problems from these sources.

If you wish to rack mount your Threshold SL10 audio module it will be advisable to employ thin nylon washers under the heads of the securing bolts to avoid scratching the aluminum faceplate.

2. POWER CONNECTIONS

To reduce the chance for ground loops and their associated noise, all components comprising a high fidelity system should receive their earth ground connection through a single component of the system which is properly earth grounded through its three conductor power plug. If only one component carries a three conductor plug this will automatically happen via the audio cables when the equipment is interconnected no matter whether the individual pieces are connected to their "convenience" AC outlets, or the same or different wall outlets. To achieve these results, "cheater" plugs may be employed on all but one component if multiple components in a system are equipped with three conductor power cords.

Because all Threshold amplifiers, as well as those of most high quality manufacturers, are equipped with three conductor power cords these units naturally lend themselves to providing the single earth ground connection required in a system. For this reason the power module of your SL10 is provided with a power cord whose third conductor is electrically isolated from the system grounding while it maintains a high voltage shock protection capability. This cord should be *firmly* inserted in the POWER SOURCE connector on the power module and may be connected to any convenient AC power source of correct rating. THE POWER CORD SHOULD NOT BE INSTALLED, REMOVED, OR LEFT DETACHED FROM THE MODULE WHILE CONNECTED AT THE OTHER END TO A POWER OUTLET.

Attach the power transfer cable between the power module and SL10 audio module by inserting the appropriate Cannon plug on the end of the cable into the OPERATING POWER connector on each module. Insert each plug into the connector until it "clicks" into a locked mode.

Once connected to its power module the circuits of the SL10 audio module will energize as soon as AC power is applied to the power module. At this moment of turn-on a large energy transient is generated as the audio circuits of the SL10 rise to operating voltage levels. To prevent this potentially damaging surge from entering other components, the output terminals of the audio module are shorted to ground until the audio circuits achieve regulation. Conversely, the outputs are again shorted prior to the circuits leaving regulation should power to the SL10 be interrupted.

The shorting function is performed by a precision DIP relay situated outside the signal path of the SL10 circuitry. It allows the SL10 to be switched on and off simultaneously with an associated power amplifier either through an external switching system, or the "switched" AC outlet of the amplifier if one is provided.

Nevertheless, it is recommended that the SL10 remain connected to an operating power source at all times. Your SL10 has been designed for this constant stand-by condition, without compromising the life expectancy or performance of its components, and exhibits a minuscule energy draw in this mode.

The power supply module of your SL10 is wired for the power service supplied in the country of original consumer sale unless manufactured on special order. The power rating applicable to a particular unit is specified both on the outer packing carton and on the serial number plate affixed to the power module. If you remove your Threshold SL10 from the country of original sale be certain that power supplied in any subsequent location is suitable before connecting and operating your SL10. Severe damage may occur if an SL10 is connected to an incorrect power source. UNDER NO CIRCUMSTANCES BYPASS A FUSE ON THE S1 POWER SUPPLY MODULE OR REPLACE IT WITH ONE OF A HIGHER VALUE. DO NOT CONNECT THE S1 TO AN AC POWER SOURCE, OR OPERATE THE AUDIO MODULE, WITH THE S1 COVER REMOVED.

3. SIGNAL CONNECTION

Input and output signal connections to your Threshold SL10 are made through isolated, 18 carat gold plated, "phono" connectors on the rear panel of the audio module. To assure uncompromised long-term performance and reliability, only high quality audio cables and connectors should be used in conjunction with the SL10. These should ideally be produced by a manufacturer recognized for his familiarity with the specific requirements of audio interconnections. The *upper* row of connectors on the audio module rear panel is for LEFT channel information, the *lower* row is for RIGHT channel information. To maintain optimum noise levels, there should be no common connection between signal grounds or between signal and chassis grounds.

BE CERTAIN THAT THE ASSOCIATED AMPLIFIER IS TURNED OFF FOR AT LEAST 60 SECONDS BEFORE MAKING OR BREAKING ANY AUDIO SIGNAL CONNECTION.

a. TURNTABLE INPUT

These two input pairs, designated HIGH IMPEDANCE and LOW IMPEDANCE, are designed to accept all types of phono cartridges exhibiting a velocity characteristic output. Cartridges falling into this category are exemplified by moving magnet, moving iron, moving coil, unpowered electret, and ribbon designs. Circuit characteristics are tailored to specific cartridges within this group by means of three toggle switches located on the rear panel of the audio module and adjacent to the TURNTABLE INPUT connector pairs.

The TURNTABLE INPUT of your SL10 will provide these velocity characteristic cartridges with equalization which is the exact reverse of the RIAA recording characteristic and uses individually selected components to insure an extremely high and consistent level of accuracy. The input stage overload point exhibited by the TURNTABLE INPUT is 300 millivolts peak at 1,000 Hz, 2.5 volts peak at 20,000 Hz, for high impedance cartridges and greater than 1.5 milliamperes current for low impedance cartridges at any frequency.

IMPEDANCE RANGE. The velocity cartridges described above can be divided into two categories: *high impedance* and *low impedance.* Cartridges requiring the "standard" magnetic cartridge input impedance of a nominal 47,000 ohms are considered *high impedance.* Cartridges requiring a lower impedance, which may fall between 1 ohm through 50 ohms, are considered *low impedance.* From the manufacturer's specification sheet accompanying your cartridge determine the terminating impedance required and connect your cartridge to the required HIGH IMPEDANCE or LOW IMPEDANCE input pair.

While both a high impedance range cartridge and a low impedance range cartridge may be simultaneously connected to the SL10 without interaction, *only one* of the input pairs can be admitted to the preamplifier signal path at a time. This selection is made by the IMPEDANCE RANGE switch located between the HIGH IMPEDANCE and LOW IMPEDANCE input pairs. Move the switch toward the input pair you wish to admit to the preamplifier circuitry. OBSERVE THE CAUTION LISTED ELSEWHERE REGARDING THE TRANSIENT IMPULSE THE OPERATION OF THE SWITCH WILL PRODUCE.

4. OPERATING CONTROLS

a. SELECTOR

The selector of your SL10 determines the input signal that will be fed to the preamplifier system from those in the TURNTABLE and HIGH LEVEL input groups. The designations to the side of the SELECTOR knob correspond with those identifying the input connectors on the back panel of the SL10 audio module. The signal designated by the SELECTOR will also appear at the RECORDING SIGNAL connector pair on the rear panel.

b. MONITOR

The MONITOR control selects the signal to be routed through the balance and gain controls and appear at the preamplifier output connectors. The choice is made from between the material indicated by the SELECTOR control on the SL10 front panel or the information applied to the MONITOR SIGNAL connector pair in the TAPE RECORDER group on the rear panel.

This feature of your SL10 allows instant comparison between the program source and recorded output of an associated tape recorder having tape monitor capability. With the MONITOR control in the SELECTOR position the program source will be heard, in the RECORDER position the playback of the associated recorder will be heard without interference to the material being sent to the recorder's input.

c. CHANNEL BALANCE

Balance between the left and right channels of the SL10 is affected by the CHANNEL BALANCE control. Because loudspeaker placement, room shape, and absorption characteristics within the room can all alter the balance perception, even when the signal is dead-on, some adjustment of this control may be required to achieve an accurate stereo sound field in your normal listening position.

Easiest adjustment is made with a constant signal, such as "pink" noise, applied to both channel inputs from a single source via a "Y" connector audio cable. The interstation "rushing" sound between FM channels makes a good "pink" noise source.

With the AUDIO LEVEL control at minimum, rotate the CHANNEL BALANCE control to its midposition indicated by a dot on the SL10 panel. In this position the control allows maximum gain from both channels. Advance the AUDIO LEVEL control until the "pink" noise level seems to be at your normal listening level.

When both channels are in balance, the test signal should aurally appear to emanate from directly between your two loudspeakers when heard from your normal listening position. If this is not the case, rotate the CHANNEL BALANCE control left or right *opposite* from the channel toward which the sound is biased until the sound assumes a central position. The CHANNEL BALANCE control will attenuate the sound of a selected channel a maximum of −6 dB at either the left or right limit of rotation.

If the sound cannot be made to assume a proper "fix," check the wiring to the loudspeakers to make certain that one channel has not been inadvertantly connected out-of-phase. The owner's manuals accompanying your amplifier and loudspeakers will detail the correct connections to assure proper phasing.

d. AUDIO LEVEL

The AUDIO LEVEL control used in your SL10 is a Waters high precision, conductive plastic element, noise-free, dual potentiometer. Each control has been individually calibrated to maintain a tracking tolerance within 1dB between channels. Rotation of the AUDIO LEVEL control simultaneously adjusts the loudness of both channels of your SL10.

The AUDIO LEVEL control affects *only* the signals appearing at the preamplifier output connectors of the SL10 and does not affect the level of a signal appearing at the RECORDING SIGNAL connector pair.

LIMITED THREE YEAR WARRANTY

Your Threshold SL10 preamplifier is engineered to the highest standards of the industry and was built by dedicated people. It was thoroughly tested for all operating characteristics and finish prior to leaving the factory. Every active solid state device in the SL10 preamplifier was individually tested on precision equipment to select it for not only its intrinsic performance, but its position in the circuit as dictated by the level of overtolerance to be incorporated by any particular point. Threshold stands behind the SL10 with the following warranty:

Any failure of a Threshold SL10 preamplifier to operate or to meet specifications, applicable at time of manufacture, due to a manufacturing defect, will be corrected by Threshold Corporation without charge for parts, labor, or surface transportation to and from the factory from your authorized Threshold dealer, for the defective module or complete unit as required by Threshold for a period of three years from date of purchase. This warranty is extended to the original purchaser only, and is contingent upon purchase from an authorized Threshold dealer. It must be effected through an authorized Threshold dealer.

The following situations are specifically excluded from warranty coverage:

1. Any Threshold SL10 preamplifier under performance testing by any facility or personnel not authorized by Threshold Corporation.
2. Any Threshold SL10 preamplifier not operated in accordance with the instructions contained in this manual.
3. Any Threshold SL10 preamplifier which, in our sole opinion, has been subject to accident, abuse, tampering, modification, neglect, or has had its serial number removed or defaced.
4. Any consequential damage of any nature.

This warranty gives you specific legal rights. You may also have other rights which are particular to your state.

If your Threshold SL10 preamplifier should require service under warranty, take it, with proof of purchase date, and with its carton and packing material, to your Threshold dealer. He will handle all details required for factory warranty repair. Direct shipments to the factory will not be accepted.

Threshold products whose original consumer purchase was made outside the United States will be covered by those warranty conditions extended by the importing distributor which may differ in some respects from those given above. Warranty service, if required, is the responsibility of, and will be effected by, the importing distributor.

If a Threshold product is removed from the country in which the original consumer purchase was made, Threshold distributors and/or authorized dealers in any subsequent country are not obligated by the terms of this warranty. Any repairs under the terms of this warranty will be made at the discretion of the distributor or dealer.

Because Threshold is constantly researching new technology and materials, the option is reserved to incorporate design refinements into existing product lines without notice or obligation. For this reason, any current Threshold product may differ in some respects from its published description but it will always equal or exceed the performance of the original design.

If practical, these design modifications will be incorporated in prior units, which have been registered with Threshold Corporation via their product registration cards within 10 days of purchase, for a reasonable charge through an Authorized Threshold dealer.

It is Threshold's policy to defer to the customer whenever a reasonable doubt exists. However, freight charges will be billed for any units or modules returned under warranty and found by Threshold to be operating in accordance with their specifications.

CARE

Because all input connectors, as well as all circuit board paths and switch contacts of the Threshold SL10 are gold plated, they will exhibit no oxidation problems. All rotating controls are environmentally sealed to eliminate any possibility of dust entry so that the only maintenance required by the SL10 is an occasional cleaning of its metal chassis parts.

To clean these surfaces, we recommend sparing use of a liquid glass cleaner such as Windex or Ajax window cleaner and a lint-free cloth. DO NOT USE A PETROLEUM SOLVENT, AN ABRASIVE, OR ANY CLEANER CONTAINING ALCOHOL ON ANY PORTION OF THE SL10.

Remember that the aluminum alloy of which your SL10's faceplate is made is an inherently "soft" metal. It will not withstand the careless use of tools during the course of installation.

SL10 TECHNICAL DATA

description Two channel, low level signal processing unit having switch selected capacitance or impedance load characteristics for matching all velocity characteristic cartridges. Built-in, preliminary gain phono stage, operated without feedback, for moving coil or ribbon cartridges. Three high level amplitude characteristic (flat) inputs. Record/monitor facilities for a single tape recorder. Front panel control functions consist of program selection, instantaneous source or recorder monitoring, channel balance, and audio level. Audio processing circuits are powered from a separate power supply module and operate with a total of 20,000 microfarads capacitive regulation throughout the supply circuitry.

Audio circuits incorporate ultra-fast, cascode/class A, direct coupled operation. High gain 200,000,000Hz semiconductors are selected through noise and curve-trace linearity analysis. Auto-null assures dc offset of no more than ± 10 mv maximum at the output, even when injected at the input by associated equipment, without affecting audio response. Superior power supply rejection through quadruple decoupling.

ACTIVE CIRCUIT DATA
(performance of the high level basic gain stage outside the system)

frequency response dc through greater than 10,000,000 Hz

rise time Less than .05 microseconds

propagation delay Input to output transit time: less than .02 microseconds

phase shift Less than 10° at 1,000,000 Hz

THROUGH-THE-SYSTEM DATA

frequency response dc through 200,000 Hz into 1,000 pf, 10,000 ohm load (IHF standard) +0−3dB

distortion Total harmonic distortion: .01% at 1kHz and 3 volt output for phono stage. Total harmonic and intermodulation distortion: .005% 20 Hz through 20,000 Hz and 3 volt output for high level stages. Essentially no distortion components detectable above second harmonic.

maximum output before clipping ±12 volt peak

magnetic phono input stage overload High impedance: 300mv peak at 1,000 Hz. 2.5v peak at 20,000 Hz. Low impedance: 1.5 milliamperes for any frequency.

slew capability Maximum voltage slewing rate: 150 volts/microsecond. (resistively loaded)

impedance Turntable input: switch selectable 1-15, 15-30, 30-50 ohms, or 47,000 ohms with 100 pf, 200 pf, 400 pf capacitance. High level inputs: 25,000 ohms. Preamplifier output: 475 ohms

gain factor Magnetic phono stage: +33dB at 1,000 Hz. High level stage: +20dB

hum and noise −82 dB (ASA weighted)

dimensions: Faceplate: 19 inches wide, 2.62 inches high. Chassis: 17 inches wide, 2.215 inches high, 8 inches deep. Power supply: 8 inches wide, 3.375 inches high, 5 inches deep.

AVAILABLE ACCESSORIES

Rack mount kit for S1 power supply consisting of 19 inch wide faceplate matching that of the SL10 audio module, hardware, and instructions.

Because Threshold is constantly researching new technology and materials the option is reserved to incorporate design refinements and/or modifications into existing product lines without notice or obligation.

Threshold Corporation

1832 tribute road suite e sacramento california 95815 (916) 927-5061

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