

OPERATING MANUAL

Threshold Audio Power Amplifiers

model SA/1 Class A Stasis
model SA/2 Class A Stasis
model SA/3 Class A Stasis

model S/200 Stasis
model S/300 Stasis
model S/500 Stasis

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Thank you for the confidence you have expressed in Threshold through the purchase of your new Threshold Stasis power amplifier.

Your amplifier is the culmination of Threshold's more than ten years experience in the production of high performance audio electronics. It is a hand-crafted instrument assembled by a dedicated staff to the most rigorous construction standards of the industry using the highest quality parts, many of which are individually performance tested. Upon completion your amplifier was carefully adjusted and tested by a skilled technician, burned in for three days, and retested to assure utmost reliability.

When you listen to your amplifier you will appreciate the result of these painstaking efforts as a purity of instrumental timbres, a clarity of transient detail, and seemingly unlimited dynamic reserve that recreates the sense of space and dimensionality offered by the finest program sources.

Threshold Corporation and Authorized Threshold Dealers stand behind your amplifier and are ready to provide comprehensive assistance if you have any questions regarding the use of the amplifier in your system.

We know you are anxious to listen to your new Threshold amplifier. To facilitate initial installation we have provided brief hook-up instructions ahead of the detailed information contained in this manual. These instructions will allow you install and enjoy the amplifier immediately.

The remaining sections of the manual allow deeper understanding of the operation and design philosophy of the amplifier which will help assure maximum performance and pleasure in your system.

QUICK INSTALLATION INSTRUCTIONS

This section is designed to allow you to get your Threshold Stasis amplifier installed and operating as quickly as possible. Even though these amplifiers have simple interconnection to other components, it will be helpful to fully read the other sections of this manual to help avoid potential problems.

CAUTION

THE MORE POWERFUL THRESHOLD AMPLIFIER MODELS ARE BOTH LARGE AND HEAVY. THEY CARRY THE POTENTIAL FOR SUBSTANTIAL PERSONAL INJURY AND/OR PROPERTY DAMAGE IF AN ACCIDENT OCCURS DURING THE COURSE OF INSTALLATION.

FOR THIS REASON WE STRONGLY URGE YOU TO ARRANGE FOR ASSISTANCE WHEN INSTALLING OR RELOCATING THRESHOLD POWER AMPLIFIERS.

1. Place your Stasis amplifier as near its final installation position as possible while still leaving yourself access to the rear panel. Check that the front panel rocker switch is in the OFF position. Insert the power cord of the amplifier into the AC POWER CONNECTOR on the rear panel and then connect it to an AC power outlet.

2. Check to make certain that all associated equipment is turned off and make the appropriate line level input and power output signal connections from the output of your preamplifier and to the speakers you are using. Be sure the speakers are correctly phased.

3. Carefully move your amplifier into its final position. Be sure to allow sufficient room for ventilation around the chassis cover and the heat sinks. The amplifier must not be confined in a space that will produce a build-up or recirculation of heated air around it. With your preamplifier's volume control at minimum, turn on your preamplifier and then your amplifier. Select a program source and advance the preamplifier's volume control to the desired level.

GENERAL INFORMATION

The Threshold amplifier you have selected for inclusion in your audio system is one of a new series of Stasis amplifiers that have brought this proprietary technology to its most advanced level. Threshold Stasis amplifiers are the product of a company noted for innovative thinking where hand-craftsmanship is maintained side by side with the use of precise instrumentation. Your new Threshold amplifier continues a heritage of advanced technology embodied in superbly crafted products of extraordinary reliability.

In 1975 Threshold developed and patented the dynamic bias Class A audio amplifier, the innovative and classic 800A. This amplifier was very advanced for its time and spawned a host of derivative products from foreign and domestic manufacturers.

Subsequently Threshold developed a radically new circuit configuration for optimizing gain stage performance by maintaining the gain devices (transistors, FETs, or tubes) in an unchanging state of voltage and current (Stasis) where the distortion drops dramatically.

These amplifiers represented a true breakthrough with a level of accuracy high enough that overall feedback correction could be eliminated. Unconstrained by the mixing of output stage correction with the input signal, Stasis amplifiers achieve sonic purity with the speed, stability, and spectral consistency of performance unavailable in conventional designs.

Your new Threshold Stasis amplifier offers significant refinement over earlier versions of the design. Building upon improvements in topology and advances in semiconductor technology, your amplifier delivers higher speed, greater dissipation margins, higher power supply capacity, and much larger continuous and peak output current. Your amplifier incorporates a new bias circuit that reduces the warm-up period required for optimal performance.

Supporting the technical advances of your Threshold Stasis amplifier are components and craftsmanship of the highest quality, assuring that its capabilities and value will remain unchanged over years of rigorous usage. No expense was spared in the realization of the active circuits of your Stasis amplifier and its visual design is an embodiment of similar excellence.

Your Threshold Stasis amplifier is one of a family of high technology audio components hand-built by Threshold in relatively small numbers. As a result, the availability of Threshold products is limited, but each owner is assured that their unit has received the individual attention that is beyond the capability of high volume manufacturers.

Threshold's innovative technology, care and attention to detail has earned a world-wide reputation for state-of-the-art performance, high reliability and enduring quality. You may be sure your Threshold amplifier will provide the years of superb operation expected from a classic piece of equipment.

DETAILED OPERATING INFORMATION

LOCATION SELECTION

Two factors must be considered when selecting the location for your Threshold Stasis amplifier. First, sufficient clearance to insure adequate ventilation. Second, proximity to low level gain stages of the associated preamplifier.

At least two inches at either side and above an S/series Stasis amplifier are required if it is installed in an open back rack or cabinet. Three inches at either side and four inches above the amplifier are required in the case of SA/series Class A Stasis amplifiers. This much clearance will allow the amplifier to dissipate sufficient heat during normal operation. The primary thing to remember is that heated air must not be allowed to build up around the amplifier in its operating location. If it is installed in a cabinet whose back is closed or which is placed against a wall other openings or a forced air system must be provided to insure that heated air is carried away.

The toroidal power transformer of your Threshold Stasis amplifier produces some local magnetic field that can induce hum pickup in magnetic phono cartridges or the low level sections of a preamplifier's circuitry. For this reason you will not want to place turntables or phono gain stages in close proximity to the amplifier. Spacing such equipment at least a foot away will generally prevent hum pickup.

POWER SOURCE CONNECTIONS

IMPORTANT: ALWAYS UNPLUG THE POWER CORD FROM A LIVE POWER SOURCE BEFORE INSTALLING OR REMOVING IT FROM THE CONNECTOR ON THE REAR PANEL. DO NOT LEAVE THE CORD FREE OF THE AMPLIFIER WHILE IT IS CONNECTED TO A LIVE POWER SOURCE.

TO AVOID DANGEROUS ELECTRICAL POTENTIALS DO NOT REMOVE THE COVER OF YOUR AMPLIFIER OR SUBJECT IT TO RAIN OR MOISTURE. NEVER INSERT ANYTHING INTO THE OPENINGS OF YOUR AMPLIFIER.

To reduce noise from ground loops it is occasionally necessary that all components comprising in a system receive their earth ground connection through a single piece of equipment which is properly earth grounded. If only one component carries a three conductor plug this will automatically happen via the audio cables when the equipment is interconnected. When necessary, "cheater" plugs with their ground wire unconnected may be employed to remove the duplicate earth ground connection of units. In this case, we recommend that the power amplifier be the earth grounded unit.

Your Threshold amplifier is provided with a heavy duty removable line cord that is part of a three conductor power system. This provides the greatest possible protection against shock when the equipment is in use. This cord should be firmly inserted in the AC POWER CONNECTOR on the amplifier's rear panel and may be connected to any convenient ac power source of correct rating.

Your Threshold power amplifier is capable of briefly drawing large amounts of current, and for that reason we discourage connection of the amplifier through the "switched" outlets that may be provided on the associated preamplifier since the turn-on surge drawn by the is large enough to damage the switches of many preamplifiers. By way of illustration, the larger Threshold amplifiers are provided with breaker switches designed to repeatedly withstand 250 amp surges.

Your Threshold amplifier is wired for the power service supplied in the country of original consumer sale. This power rating is specified both on the outer carton and the serial number plate located on the rear panel of the amplifier. If you remove your amplifier from the country of original sale be certain that power supplied in any new location is suitable before installation of the amplifier. Impaired operation or substantial damage may occur if operation of an amplifier is attempted when the unit is connected to an incorrect power source.

If your home is not equipped with three-conductor wall outlets connect the amplifier through an appropriately grounded adaptor. These may be obtained at any hardware store. Be certain that the adaptor's ground makes electrical contact to a ground surface. In some older homes you may find that the electrical conduits are not at earth ground potential, and you must find an alternate ground path.

SIGNAL INPUT CONNECTIONS

Audio signal input to your Threshold Stasis amplifier is made through RCA phono jacks. A pair of these connectors is located on the back of dual channel Threshold amplifiers, and a single connector for single channel amplifiers. These inputs are designed to accept line level audio signals which are characteristic of those available at the outputs of preamplifiers, signal processors, AM/FM tuners and the like.

If your Threshold amplifier is being used in conjunction with any accessory switching unit designed to switch both inputs and outputs, such as an auditioning panel of the type used by some audio dealers, care must be taken in determining that no common junction exists between input and output ground connections. A return pathway between input and output grounds may result degradation of sound quality or misbehaviour of the audio system, conceivably resulting in damaged components.

SIGNAL OUTPUT CONNECTIONS

Audio signal output to the loudspeakers is made through gold plated five-way binding posts. Each channel's output connector consists of a red and a black post on a common base.

These outputs, should be considered as electrically isolated from the chassis and from each other. In the case of dual channel amplifiers there should be no direct interconnection between the output terminals of the two channels under normal operation. Connect the output terminals of each channel only to the loudspeaker, not to each other or to anything else.

We have supplied two dual banana plug connectors which are designed expressly for use with your amplifier's five-way binding posts. Use of these connectors will insure positive and short-free speaker connection. Other connectors which are compatible with the amplifier's output posts, or direct wire connection may be used if you wish. Here is how to attach the connectors we have supplied to your speaker leads:

First examine the dual connecting cord you are using. It should be heavier than 18 gauge (larger gauge = heavier wire) and its outer covering should identify one of the conductors. If the covering is transparent one wire will often be colored differently. If the covering is opaque one side will carry printing, a seam, or multiple ridges to allow identification.

Take a dual banana plug and unscrew the setscrew recessed deep within each hollow plastic leg. Be careful not to loosen the screw too much or you will probably lose it in the your carpet.

You will find a ridge along the outside of one of the legs of the plug. Connect the conductor coming from the ground or "-" terminal of your loudspeaker to this leg of the plug. To do this strip about 1/4 inch of insulation off the end of the conductor, twist the strands of exposed wire tightly together and insert the twisted wire into the hole drilled through the inner metal of the plug. Tighten the setscrew in the leg to clamp the twisted wire tightly in the the connector. Repeat this operation with the other leg of the plug and the wire coming from the hot or "+" terminal of your speaker. Repeat the procedure for the other loudspeaker cable

Connect the leads coming from the left loudspeaker to the output binding post assembly for the LEFT channel. The ridged leg of the dual banana plug is inserted in the black (-) post of the assembly. Similarly connect the right loudspeaker to the RIGHT channel output.

Double check to make certain that the black (-) post of each channel's output is connected to the ground or "-" input of its respective speaker. This assures that your loudspeakers are connected in-phase.

If the speakers are connected out-of-phase, that is, not wired identically, a given input signal will cause the cone of one speaker to move forward while the cone of the other moves backward. When the speakers of a stereo system are incorrectly phased the sound will be lacking in deep bass and image incorrectly.

THERMAL PROTECTION

Your Threshold amplifier maintains its operating temperature through air convection cooling. While this requires substantial heat sinks it eliminates the noise associated with fans. More importantly, there are none of the problems that result from dust drawn into the interior circuit boards, components, or heat sinks.

Because of hot air's tendency to rise, cool air is drawn up through the heat sink fins on either side of the amplifier as heat is transferred from the fins to the air. For this reason natural airflow upward through the fins should not be impeded and the amplifier must not be placed in an environment where heated air is allowed to build up or simply recirculate around the heat sink fins.

To provide this required airflow at least two inches of space at either side, and two inches above an S/series Stasis amplifier is required if it is installed in an unobstructed open back rack or cabinet. Three inches at either side and four inches above the amplifier is required for SA/series Class A Stasis amplifiers.

Under most home situations reasonable care will provide an environment sufficient for adequate cooling. However additional space may be required when the amplifier runs too hot.

For S/series amplifiers a good rule-of-thumb is: if it becomes unpleasant to hold your hand on the fin surfaces of an idling S/series amplifier for more than 10 seconds it is operating excessively hot.

For SA/series amplifiers this is the normal idling temperature, and excessive heat will most likely show itself in an untouchable heat sink. For this reason caution should always be observed when approaching a possibly overheating amplifier.

Because each power transistor is typically operated at 5% of its rated capacity, a hot heat sink still represents a perfectly safe operating temperature for the actual semi-conductors. The heat dissipation capability of your Threshold amplifier, assures that each power transistor is never subjected to serious thermal stress, giving it a long probable life.

To monitor thermal conditions your Threshold amplifier is equipped with temperature sensors for each channel. Should abnormally heavy operation, or inadequate ventilation allow an output stage to overheat, the sensors will turn the affected channel(s) off. When this occurs sound from that channel will virtually cease. When the temperature has reduced to a safe operating level the channel(s) will automatically resume operation.

If your Threshold Stasis amplifier persists in going into thermal shutdown, or operates one heat sink at a significantly higher temperature than the other even it indicates of one of the following problems: 1) Inadequate ventilation, 2) a defective loudspeaker load, 3) a fault in system grounding, signal shielding, or the source equipment that causes high frequency oscillation in the system, or 4) a defective amplifier component. Should symptoms indicate one of these problems do not operate the amplifier and contact your Authorized Threshold Dealer.

ELECTRICAL PROTECTION

IMPORTANT: UNDER NO CIRCUMSTANCES BYPASS ANY FUSE IN YOUR AMPLIFIER. NEVER REPLACE A FUSE WITH ONE OF A HIGHER VALUE OR WITH ONE HAVING A SLOW-BLOW CHARACTERISTIC WITHOUT FACTORY AUTHORIZATION. REPLACE ANY FUSE OF YOUR AMPLIFIER ONLY WITH THE VALUE AND TYPE SPECIFIED FOR ITS APPLICATION IN THE FUSE VALUE TABLE LOCATED ON THE REAR PANEL OF THE AMPLIFIER. NEVER INSERT ANYTHING THROUGH AN OPENING AND INTO THE AMPLIFIER.

Your Threshold Stasis amplifier employs fusing in the AC line and both the positive and negative supply rails. As supplied from the factory your amplifier is equipped with fuses that will allow maximum current and voltage output in the reproduction of program material while still providing a safety margin in the event that a problem occurs.

As your Threshold amplifier uses no fusing in series with the output it is well to remember that the loudspeakers can be sent full amplifier power. A moment's inattention, such as the removal of an audio interconnection while the amplifier is turned on can result in speaker damage.

The positive and negative rail fuses for a channel of your amplifier are located above and below the channel's input and output connectors. These fuses are in series with the supply rails and are intended to disconnect power to an overstressed or damaged channel. When one or both rail fuses are opened by an abnormal condition, output from the affected channel or channels will cease. However, the amplifier's "on" indicator light will remain lit.

Adjacent to the power source connector is a fuse designated AC LINE FUSE. This fuse is in series with the ac power and is intended to disconnect all power to your Threshold amplifier should a fault condition occur.

On all Threshold Stasis amplifiers except the S/200 the POWER ON/OFF switch is actually a resettable circuit breaker. It will also disconnect all ac power to the amplifier if the amplifier draws more than 15 amps continuously. It was selected for its ability to accept a transient surge 18 times its continuous rating without tripping, a characteristic required by the large current in-rush drawn at the moment of turn-on.

A blown fuse or tripped breaker is usually symptomatic of a fault or failure either in the amplifier or in the associated equipment or its interconnections. If operation is interrupted by the fuses, allow a few minutes before replacing the fuses. Then carry out the following re-start procedure:

Turn off and disconnect all equipment from the amplifier, including the loudspeakers. Replace the open fuses with new IDENTICAL VALUE FAST BLOW fuses. Press the power switch to turn the amplifier on again. Wait a moment and then turn the amplifier off. Wait another moment and then check the fuse which was previously blown.

If the fuse is blown again, the fault will probably lie within the amplifier. Contact your Threshold dealer who will arrange for its repair.

If the fuse has not blown again, some external condition probably caused the problem. In this case your Threshold dealer can advise you as to the probable cause.

DESIGN AND CONSTRUCTION

GENERAL

All Threshold Stasis amplifiers are non-inverting, complementary-symmetry power amplifiers that use Threshold's proprietary Stasis output stage and front end technology. The design approach of Threshold amplifiers places simplicity of gain path foremost and relegates necessary complexity to support circuits outside of the signal path. The discrete components used in construction of Threshold amplifiers are individually tested and hand assembled by a skilled construction staff. Each power semiconductor is tested to its high voltage static and secondary breakdown rating and each completed amplifier is required to pass a dead-short test both before and after three days of power burn-in into 2 Ohm loads.

STASIS OPERATION

Your Threshold Stasis amplifier is a departure from the historic techniques used to achieve linear response from inherently nonlinear tubes, transistors or FETs. The Stasis topology has a single characteristic that sets it apart from other amplifier designs.

The output stage of a Stasis amplifier is sufficiently accurate in its operation that no feedback loop around the amplifier is necessary.

Unlike other amplifier designs, your Stasis amplifier's front-end circuitry is never required to correct for errors generated by the output stage.

In other amplifiers global feedback or feedforward is used to correct for errors committed by the gain stages. In these cases it is presumed that the way to correct for device nonlinearity is to measure the error and inject a compensating error (distortion in reverse) into the circuit.

Lowering distortion through application of a negative feedback loop has often been seen as a perfect solution, but this is not the case. The problem with feedback is that it's effectiveness at producing quality reproduction diminishes the more you need it. Paradoxically, analytic feedback theory assumes a linear amplifier, just the kind of amplifier which would not require feedback in the first place.

When an device distorts, its gain changes. This is the definition of distortion - a change in gain with signal. Dynamically the amplifier's loop gain will alter when distortion occurs so that the reduction in distortion is not constant. Under extreme conditions, such as the nonlinear crossover region at low levels or under highest levels where clipping occurs, the gain drops to a low value.

Because corrections made by feedback take a finite time to affect the output, the amplifier must be many times faster than the fastest signal of interest while simultaneously its feedback must be reduced at the higher frequencies. If this is not done the amplifier will exhibit instability, manifested by oscillation or by behavior near oscillation in which the amplifier becomes so preoccupied with feedback that it fails to make the proper corrections. Heavy use of feedback can actually lead to signal loss in extreme cases of transient intermodulation distortion, where parts of the signal will actually disappear under high slew conditions

Threshold Stasis amplifiers do not attempt to extract linear results through imposition of a corrective distortion loop around the amplifier system. Instead, they are able to maintain the transistors themselves under conditions of voltage and current where their gain characteristics become more constant so that less inherent distortion results.

The Stasis operating principle is based upon a simple patented binary output stage in which an extremely linear voltage amplifier operated in pure Class A determines signal accuracy by supplying the voltage across the load. The voltage amplifier is connected directly to the load in tandem with a powerful current mirror. It is the current mirror "bootstrap" that supplies most of the current to the load.

As the voltage amplifier has little work to do its gain transistors can be held in Stasis, a virtually unchanging condition relative to current. Without being subjected to fluctuating current the devices of the Stasis section maintain uniform gain and freedom from distortion. Because the output impedance of the Stasis section voltage amplifier is very low relative to the output impedance of the current bootstrap it is able to dominate the performance of the tandem system. In this way the linearity of the output stage is essentially that of the Class A Stasis section.

Threshold S/series Stasis amplifiers employ pure Class A operation in all signal portions of the amplifier except the power current sources in the bootstrap section of the output stage, where heavily biased AB operation is used.

In SA/series Threshold Stasis amplifiers the bias of the current bootstrap section is increased to pure Class A. This improves the linearity of the current bootstrap section and significantly lowers the nonlinearities the Stasis section must absorb. While this exacts a penalty in the form of efficiency, it results in an instrument whose extraordinary musical accuracy defines the state-of-the-art.

FRONT END DESIGN

The input stage for each channel of your Threshold Stasis amplifier consists of matched N-channel JFETs operated in a cascode configuration and driving gain transistors loaded with doubly regulated constant current sources.

The approximately one-trillion Ohm active impedance of the input JFETs dramatically reduces possible interaction with the signal source that occurs with bipolar devices, assuring completely passive response from the input networks. The cascoding of the input stage assures the circuit immunity to distortion and noise induced through power supply fluctuation.

The superior linearity of the JFETs allows a circuit topology in which minimal distortion can be maintained with only local feedback applied. In addition, the only capacitors associated with the signal path are film polycarbonate and silver mica types designed for high power and high frequency applications.

OUTPUT STAGE DESIGN

The output stage of a Threshold amplifier employs fast power devices with high safe operating areas, each rated by the manufacturer at 20 times the actual usage in the amplifier. The result is a greatly extended operating margin in which the output transistors remain unstressed, resulting in lower distortion and longer life.

With this immense reserve margin of power devices a Threshold Stasis amplifier is capable of great signal accuracy into any load regardless of its impedance or reactance characteristics. In addition, it is not necessary to impose active protection to safeguard the output stage or to impose fuses (and their measurable modulation distortion) between the output transistors and the loudspeaker.

In conventional amplifier designs the output damping factor is derived through feedback. Because feedback loops are made stable by reducing feedback at higher frequencies and by the imposition of output inductors, the damping factor of such an amplifier can decrease to surprisingly low values at higher frequencies.

It is not a correct assumption that damping is needed only at lower frequencies for woofer control. A good damping factor is required at higher frequencies also where, for example, popular electrostatic loudspeaker impedances often drop to .5 Ohm. A damping factor of 10 will then mean more than 3 dB loss at this point and loss of control over the transformer which is ringing at these frequencies. The presence of a good damping factor will also benefit cone loudspeakers at higher frequencies resulting in less distortion by the speaker and improved transient response.

Since Threshold Stasis amplifiers do not derive their damping from global feedback or use an isolation inductor their damping maintains its high value across the entire frequency band. Additionally, SA/series Threshold Stasis amplifiers are characterized by a damping factor at least twice that of their sister S/series models.

POWER SUPPLY

Threshold Stasis amplifiers are equipped with custom manufactured toroidal power transformers that are capable of providing twice their continuous rating for long periods of time. This insures that the transformer is able to source a constant voltage under any load demand encountered by the amplifier. The output of the transformer passes through 35 amp diodes and is smoothed into a dc voltage by computer-grade electrolytic capacitors. Voltage fluctuation under musical power conditions into 4 ohms rarely exceeds 5%.

COMPONENTS AND CONSTRUCTION

Your Threshold Stasis amplifier is built to the high standards of craftsmanship and finish for which Threshold has received world-wide recognition. All circuit components are selected from the finest available. The gold plated machined Teflon insulated input connectors are exclusively manufactured for Threshold. The high current five-way output binding posts have gold plated contact surfaces. Circuit boards are military-grade glass-epoxy with gold over nickel paths and all internal connections are hand soldered. Metal film and wirewound resistors are used throughout. Only high quality film and silver mica capacitors are employed in the signal path. Assembly and final adjustment is completed under the supervision of Nelson Pass, originator of the Stasis circuit and co-founder of Threshold.

CARE

The signal connectors of your Threshold Stasis amplifier are gold plated and their surfaces will exhibit no metal oxidation. The only maintenance required is an occasional cleaning of the metal chassis parts. At the factory detail cleaning of metal surfaces is done using a lint-free wiping paper and Easy Off spray window cleaner. White vinegar or a dilute ammonia solution may also be used, however, because the formulas for household cleaners vary and/or change without notice, Threshold cannot assume responsibility for the results obtained with any particular product. Abrasive cleaners, polishes, or dusting sprays should not be used.

Remember that the aluminum alloy of which your Threshold amplifier is made is a soft metal. It will not withstand the careless use of tools during the course of installing the amplifier.

WARRANTY INFORMATION

Upon delivery to the first end-user consumer as a new unit this Threshold component is provided with automatic LIMITED NINETY-DAY WARRANTY.

AT THE TIME OF INITIAL DELIVERY THERE EXISTS A FREE OPTION TO OBTAIN THREE YEAR EXTENDED AND TRANSFERABLE WARRANTY.

To obtain three year extended warranty coverage the Extended Warranty Registration Card which is included with this Threshold component must be completed and returned to Threshold within 15 days of purchase.

If an Extended Warranty Registration Card was not included with this Threshold component there is no assurance that this is a new unit. If this is the case please contact Threshold Corporation.

LIMITED NINETY DAY WARRANTY COVERAGE

Your Threshold product was engineered and manufactured to the highest standards of the industry and was assembled by a dedicated staff taking great pride in their craftsmanship. It was thoroughly adjusted, inspected, and tested for flawless performance and blemish-free appearance prior to leaving the factory. Threshold stands behind this product with the following Limited Ninety Day Warranty:

Any failure of a Threshold product covered by this warranty to operate according to specifications applicable at the time of manufacture as a result of a manufacturing defect will be corrected by Threshold without charge for parts, labor, or surface transport to and from the factory from an Authorized Threshold Dealer, for the defective module or complete unit as required by Threshold, for a period of ninety days from date of purchase and not more than five months from date of manufacture.

This warranty is extended to the original purchaser, and is contingent upon purchase of the product from an Authorized Threshold Dealer.

The following situations are specifically excluded from warranty coverage: 1) Any Threshold product under performance testing by facility or personnel not authorized by Threshold. 2) Any Threshold product not operated in accordance with the instructions contained in this manual. 3) Any Threshold product which, in the sole opinion of Threshold, 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 and some of the exclusions and requirements may not be applicable in your particular state.

OPTIONAL THREE YEAR EXTENDED WARRANTY

An Extended Coverage Option is available to Threshold product owners at no charge by the completion and return to Threshold of the Extended Warranty Registration Card that was packed with the Threshold product.

Under this Extended Warranty Coverage service will be provided at no charge as described in the Limited Ninety Day Warranty for a period of three months from date of purchase (and no more than five months from date of manufacture) and without charge for parts or labor for an additional thirty-three months (and no more than thirty-eight months from date of manufacture).

Upon receipt of the completed Extended Warranty Registration Card the Threshold product owner will be issued a numbered Extended Warranty Certificate. Extended Warranty coverage may be transferred to subsequent owners of the product for the remaining period of force provided they register their ownership by the return to Threshold of the completed Transfer Of Registration form which is part of the Extended Warranty Certificate.

WARRANTY SERVICE PROCEDURE

If a Threshold product should require service under warranty take it, with proof of purchase date and with its carton and packing material, to any Threshold dealer. He will handle all the details required for factory repair. Direct shipments to the factory will not be accepted without a factory issued return authorization number which must clearly appear on the outside of the shipping carton.

Threshold products whose original consumer sale was made outside the United States will be covered by those warranty terms extended by the importing distributor which may differ 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 dealers in any subsequent country are not obligated by the terms of this warranty. Any repairs made under the terms of this warranty will be at the discretion of the distributor or dealer.

RESERVED OPTIONS

Because Threshold is constantly researching new technologies and materials the option is reserved to incorporate design refinements or modifications into production without notice or obligation. For this reason a particular Threshold product may exhibit some differences from its published description but it will always equal or exceed the overall performance of the original design.

When practical, design modifications will be incorporated in whole or in part in early units for a reasonable charge, provided these units have been registered with Threshold via the Extended Warranty Registration. Your Authorized Threshold dealer will be able to advise you of any available modifications if they become available for a product.

It is Threshold policy to defer to the customer whenever a reasonable doubt exists, however, freight charges will be billed for any product or module returned under warranty which is found by the factory to be operating in accordance with specifications.

TECHNICAL DATA

Threshold S/series and SA/series Stasis power amplifiers are non-inverting, complementary-symmetry designs that utilize Threshold's proprietary Stasis circuitry. Discrete FET and bipolar semiconductors are used throughout. No global feedback loop is employed around the amplifier's circuit.

Data is applicable to all models unless specifically noted.

RATED OUTPUT:

S/200: 100 watts/channel @ .1% distortion

S/300: 150 watts/channel @ .1% distortion

S/500: 250 watts/channel @ .1% distortion

SA/1: 160 watts @ .05% distortion

SA/2: 100 watts @ .05% distortion

SA/3: 50 watts/channel @ .05% distortion

(20 Hz - 20,000 Hz both channels driven into 8 Ohms)

BANDWIDTH: -3 dB at 7 Hz and 100,000 Hz.

SLEW RATE: greater than 50 volts per microsecond

INPUT IMPEDANCE: 75,000 Ohms.

OUTPUT TRANSISTOR COMPLEMENT:

S/200: 8 transistors/channel.

S/300: 14 transistors/channel.

S/500: 20 transistors/channel.

SA/1: 40 transistors.

SA/2: 28 transistors.

SA/3: 14 transistors/channel.

OUTPUT CURRENT CAPABILITY:

S/200: 8 continuous, 40 peak amperes

S/300: 10 continuous, 80 peak amperes

S/500: 12 continuous, 100 peak amperes

SA/1: 40 continuous, 150 peak amperes

SA/2: 30 continuous, 100 peak amperes

SA/3: 16 continuous, 80 peak amperes

(all continuous ratings are fuse governed)

POWER SUPPLY:

S/200: 400 watt toroidal transformer, 30,000 microFarads capacitance.

S/300, SA/2:, SA/3: 700 watt toroidal transformer, 60,000 microFarads capacitance.

S/500:, SA/1: 1,000 watt toroidal transformer, 120,000 microFarads capacitance.

OUTPUT IMPEDANCE:

S/SERIES: Less than 0.1 Ohm 20 Hz - 20,000 Hz.

SA/SERIES: Less than 0.03 Ohm 20 Hz - 20,000 Hz

GAIN FACTOR: +26.6 dB

NOISE: No greater than -100 dB, unweighted, referenced to rated output (input terminated in 600 ohms)

LOAD RATING: Operation is allowed into any load as permitted by power supply fuses and thermal protection

DIMENSIONS AND WEIGHT: Faceplate: 8.72" high X 19" wide. Standing height at faceplate: 9.6"

S/200: Depth: 9.125" Weight: 44 pounds (20 kilos)

S/300:, SA/2:, SA/3: Depth: 13.125" Weight: 56 pounds (25.5 kilos).

S/500:, SA/1: Depth: 17.125". Weight: 78.5 pounds (35.7 kilos).

(Depth measurement taken from rear surface of faceplate)