Threshold

Threshold Corporation

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To All Threshold Dealers: Series II Update Information

As we have stated and demonstrated in the past, we maintain a strict concern for our existing customers, and with this in mind we have developed an upgrade policy for owners of models S-150 through S-1000 at extremely reasonable prices, with special allowance for recent purchasers and dealer demonstration units.

This revision is not being made frivolously. It incorporates two years of design improvements which include the elimination of fuses and electrolytic capacitors from the signal path, improved power supply regulation and decoupling, the incorporation of FETS in the input stage, and the approximate doubling of continuous and peak amperage ratings. The amplifiers will feature more power with lower distortion, greater damping factors, and even less local feedback than previously. Most importantly, they clearly sound better in testing with the most demanding music and the most difficult loudspeakers.

We will make upgrades available at the beginning of 1984 for models S-150 through S-1000 at a customer cost of $400. Customers who have purchased these power amplifiers after June 30, 1983 will receive the update at a cost of $150.00 (which is our cost). In both cases, Threshold will pay for shipping of two channels to and from the factory. All Series II updates will occur through authorized dealers only, with the dealer receiving $125 for handling the shipping and replacing of channels with the exception of recent customers, where the update will be treated as good-will gesture by both the dealer and Threshold. Dealer demonstration units will be handled on a one-time basis at a cost to the dealer of $100.

To perform an update, the dealer must remove the two amplifier channels in an easily performed operation and ship them to Threshold. We will rebuild the channels, thoroughly test them, and return them to the dealer where they will be reinstalled, along with a new rear panel and series II logo. The dealer will be billed on a Net 30 basis without a 20 day discount. As in all transactions regarding updates, contact Douglas Dale for information or to schedule an update. Updates are on an appointment only basis.

There is currently no implementation of this update to models previous to the S-150 through S-1000 series, however the updates currently offered for models 800-A, 400-A, 4000, Stasis 3, Stasis 2, and Stasis 1 will remain in effect at reduced prices.

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THRESHOLD SERIES II REVISIONS

IMPROVED INPUT STAGE TOPOLOGY

The input stage of the power amplifier consists of a chip holding 4 matched N channel JFETS (Not MOSFETS) arranged as a matched differential input pair operated at constant voltage through cascoding effected by the other pair of matched JFETS. This is in addition to the normal cascoding also employed in the front end such that the input FETs are doubly cascoded: the regulation associated with the cascoding is applied twice, for greater than ever signal / supply effects rejection. The approximately 1 Trillion ohm active input impedance coupled with the improved linearity and lesser transconductance of the JFETs give rise to the following three effects:

A) The much greater active input impedance dramatically reduces the interaction of input devices with signal sources which occur with bipolar devices under low / no negative local feedback. This alteration dramatically raises the impedances involved in the input networks, and as such allows the elimination of the input bootstrapping network used previously to raise the input impedance for AC signals and lower it at DC to reduce input current offset effects. The bootstrapping was effective, but it involved greater interaction between the output of the amplifier and the signal source. The raising of the input stage impedance cures the distortion from both sources, assuring completely passive response from the input networks.

B) The dual cascoding of the input stage, first by matched FETS and then by bipolar devices assures a greater than ever immunity of the circuitry to distortions and noise caused by power supply fluctuation.

C) The improved linearity of the JFETs coupled with their lower transconductance yields a circuit where even less local feedback is applied without the usual increase in distortion.

ELIMINATION OF FUSES AND ELECTROLYTIC CAPACITORS FROM AUDIO PATH

The fast blow fuse between the output of the amplifier and the loudspeaker has been eliminated, along with the measurable modulation distortion inherent in such devices. The AC line and the power supply lines are still fused, affording the same protection without the coloration. The elimination of the output fuse and lowering of the source impedance which drives the output stage results in an improved damping factor, offering better control and lower distortion in the amplifier-loudspeaker interface.

The only capacitors associated with the signal path are film polycarbonate types designed for high power high frequency switching, with a voltage rating 50 times greater than actual voltage found in the circuit. The extremely low dissipation and inductance figures of the polycarbonate capacitors coupled with the much higher impedance figures afforded by the input JFETs result in a component which can be modeled as a pure capacitance.

GREATER RMS AND PEAK CURRENT CAPABILITY

The continuous output current of the amplifier has been nearly doubled to 8 amps in the S-150, 10 amps in the S-300, 12 amps in the S-500, and 16 amps in the S-1000. (16 amps is about 1,000 watts into 4 ohms).

The peak output current has been increased to 25 amps for the S-150, 35 amps for the S-300, 45 amps for the S-500, and 60 amps for the S-1000, further assuring their ability to drive the most difficult loads without strain.

IMPROVED POWER SUPPLY REGULATION

Each channel's supply rails are individually decoupled using large polycarbonate capacitors, assuring a low source impedance to the power circuitry even at the highest frequencies.

The power supply for the amplifier front end circuitry is decoupled from the output stage power supply, eliminating the supply modulation distortion and noise in the initial gain stage.

LOWER OFFSET VOLTAGES, IMPROVED SHIELDING

The use of matched input JFETS coupled with offset adjustment produce figures twice as low for DC offset voltages, less than .025 Volts, which do not change with varying input source impedance.

The front end of the amplifier now has a double sided ground plane for improved shielding of the input stage from stray signal, reducing noise and high frequency distortion.

PROTECTION CIRCUITRY

The amplifier contains sensing circuitry in each channel which senses continuous slew conditions and which will shut down the channel in the event of system oscillation resulting from poor grounding or shielding or fault in the source equipment. The amplifier itself does not require this protection, but the circuit will occasionally save a tweeter or reveal problems which seriously degrade musical performance. The amplifier also contains a sensing circuit which shuts down a channel when it is continuously clipping over greater than 50% of the waveform, acting as protection for loudspeaker during accidental or senseless overdrive.

The front end of the amplifier is enabled by a relay which shunts the output of the input gain stage to ground during the turn-on and turn-off states of the amplifier to eliminate large transients. This relay is not in series with the signal path, but prevents transient thumps in excess of .7 volts.