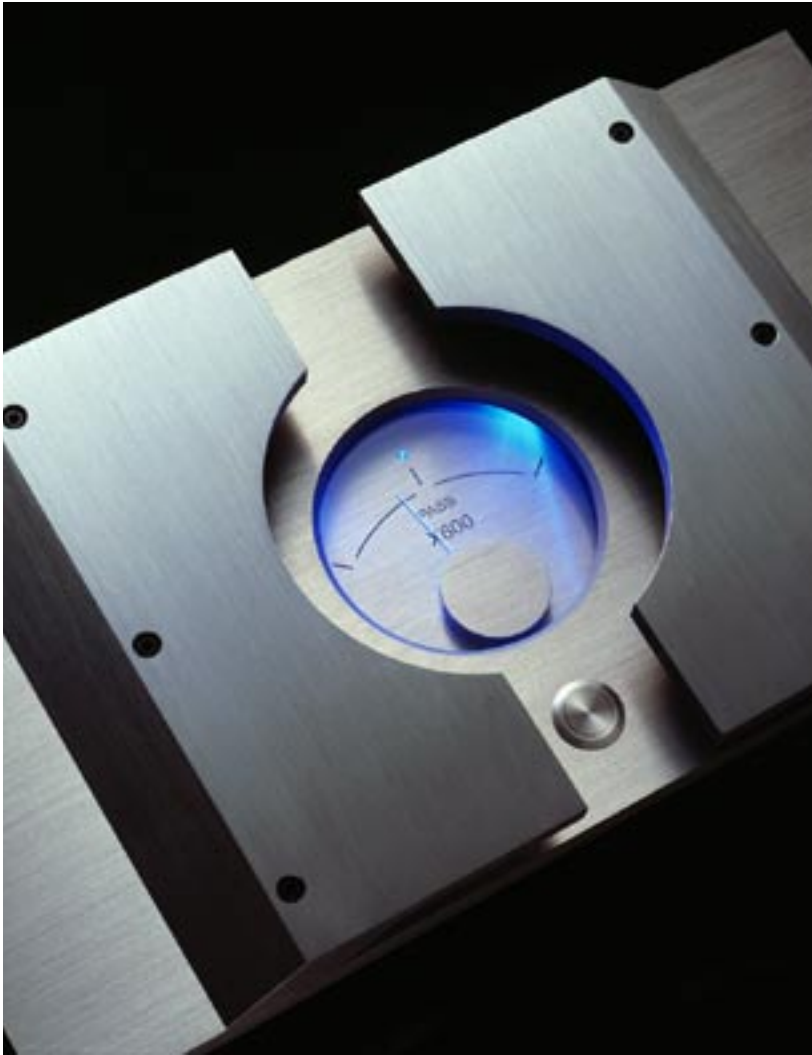


THE LEADER IN AMPLIFIER TECHNOLOGY



The X Series are the biggest and most powerful amplifiers we have ever created, but they are not unique for that reason. We have chosen the biggest and most powerful as the proper temple for a new concept in high performance audio amplification.

Called Supersymmetry™, the circuit topology was granted a U.S. patent in 1994, and is the result of 19 years of effort by Pass. The amplifier uses highly matched components in a classically simple balanced Class A circuit. The amplifier contains only two simple stages: the first is a balanced single-ended Class A voltage gain stage. Its output drives a bank of high power Mosfets operated as voltage followers without feedback.

These are inherently low distortion types of circuits, but their performance is improved when operated in balanced mode through cancellation. Distortion and noise identical to both halves of a balanced circuit will disappear at the output, and in a well-matched symmetric circuit, most of the distortion and noise is identical.

Supersymmetry enhances this effect by providing a connection between the two halves of the balanced circuit that further perfects the match. Any distortion and noise not already identical to the two halves is made identical, and the result is improved cancellation at the output.

Unlike feedback techniques where the goal is to correct for the distortion by feeding a gain stage an inversely distorted signal, Supersymmetry seeks merely to create perfect matching.

Matched balanced power circuitry typically sees a distortion and noise reduction of about 90% (20 dB) through a balanced connection without any additional effort. The Supersymmetric circuit delivers another 90% reduction, so that the X series has about 1/100 of the distortion of a conventionally simple amplifier. Actually this ordinary distortion and noise can still be seen at the output of one half of the circuit, but since it is virtually identical on the other half, it goes away at the speaker terminals. This gives good measured performance, which because it is simple, also sounds excellent.

Previously these kinds of simple Class A circuits have been popular for their sound quality in low power amplifiers, but have not found application at high power levels due to excessive distortion and low efficiency. Supersymmetry overcomes this barrier, delivering the sweetness, staging, and detail of very simple circuitry up to kilowatt power levels and beyond.

The X Series amplifiers have the tremendous dynamic range (>150 dB) to do justice to the 24 bit recordings of the 21st Century. The simple but powerful circuitry moves easily from total silence to explosive transient and back to silence without a trace. It's a spooky experience.

Because these amplifiers do not rely on output feedback for high performance, their performance is consistent across the audio band, from DC to beyond audibility. They are unconditionally stable into any loudspeaker.

The X1000 mono block has only two gain stages: a single-stage front end which provides all of the voltage gain, and a high current follower stage.

The output follower stage consists of four massive banks totaling 80 power Mosfets, aggregately rated at 12 kilowatts and biased for class A operation to 128 watts peak. Beyond the bias point, the output stage operates Class AB. The bias current is set for 600 watts idle dissipation per channel.

The power supply features two massive toroidal transformers at 4 KVA, parallel high current rectifiers, and 250,000 uF of storage at over 700 Joules.



The input and output of the amplifier is direct coupled, and the amplifier only accepts a balanced input. This is the first amplifier that truly demands balanced operation to obtain the highest performance.

For higher power operation, X1000's can be operated in an array producing up to 2000 watts per chassis. For example, two X1000's can deliver 4000 watts into 8 ohms or 2 ohms. Four X1000's can deliver 8000 watts into 4 ohms, and sixteen X1000's can deliver 32,000 watts into 1 ohm. Unlike previous efforts at harnessing multiple amplifiers through power transformers, the amplifiers are direct-coupled to the load, and retain the same performance across the audio band without added distortion and loss.

The meter on the face plate of the X1000 measures the current drawn by the output stage. At idle, it sits slightly less than full scale, reflecting the standing bias current of Class A operation. As the amplifier exceeds its class "A" rating the needle on the amplifier will register the increased bias being drawn by the output stage.

The X1000 is provided with a special high current 20 amp power cord that is not like

most of the ones you are used to. It is heavier, and mates to a standard receptacle at the rear of the amplifier. This power cord requires a high current wall socket.

The X600 utilizes the same face plate, meter, and front end circuitry as in the larger X1000. It has a proportionately smaller power supply and output stage.

The output follower stage consists of 48 power Mosfets per channel for a total of over 7200 watts short term dissipation. The power supply features a single massive toroidal transformers rated at 4 KVA, and over 180,000 uF of storage capacitance.



Like the meter on the X1000, the X600 meter measures the current drawn by the output stage. At idle, it sits at half scale, reflecting the standing bias current of Class A operation. As the amplifier exceeds its class "A" rating the needle on the amplifier will register the increased bias being drawn by the output stage.

Also like the X1000, the X600 only accepts balanced inputs.

The X350 is a stereo amplifier housed in the same chassis as the X600 mono block, utilizing the same face plate, meter, and power supply as the X600. Like the larger mono block models the X350 does not rely on output feedback for high performance and its performance is consistent across the audio band, from DC to beyond audibility. It is unconditionally stable into any loudspeaker.

The output follower stage consists of 24 power Mosfets per channel for a total of over 3600 watts short term dissipation per channel. The bias current is set for about 500 watts idle dissipation between both channels.

The input and output of the amplifier is direct-coupled, and the amplifier accepts both single-ended and balanced inputs.

The meter on the face plate of the X350 measures the total current draw of both amplifier channels. At idle, the meter sits at about half scale, reflecting the standing bias current. As the amplifier draw exceeds exceeds Class "A" operation the needle on the amplifier will register the increased current being drawn by the power supply.



Specifications	X1000	X600	X350
Gain	30 dB	30 dB	28 dB
Freq. Response	-0 dB at DC, -3 dB at 60 kHz	-0 dB at DC, -3 dB at 100 kHz	-0 dB at DC, -4 dB at 100 kHz
Power Output	1000 watts @ 1% THD, 1 kHz	600 watts max @ 1% THD, 1 kHz	350 watts max @ 1% THD, 1 kHz
Max Output Voltage	plus, minus 145 volts	plus, minus 105 volts	plus, minus 80 volts
Max Output Current	plus, minus 30 amps	plus, minus 25 amps	plus, minus 20 amps
Input Impedance	22 kohm balanced	22 kohm balanced	22 kohm balanced
Damping factor	60 ref 8 ohms nominal	60 ref 8 ohms nominal	30 ref 8 ohms nominal
Slew rate	plus, minus 40 V/uS	plus, minus 50 V/uS	plus, minus 50 V/uS
Output Noise	500 uV unweighted 20-20 kHz	500 uV unweighted 20-20 kHz	500 uV unweighted 20-20 kHz
Random noise floor	approximately 2 uV	approximately 2 uV	approximately 2 uV
Dynamic range	155 dB	153 dB	150 dB
Balanced CMRR	-85 dB @ 1 kHz	-85 dB @ 1 kHz	-85 dB @ 1 kHz
DC offset	< 100 mv	< 100 mv	< 100 mv
Power Consumption	600 watts idle, 2400 watts max	600 watts idle, 1800 watts max	600 watts idle, 1800 watts max
Temperature	20 degrees C. above ambient	20 degrees C. above ambient	20 degrees C. above ambient
Dimensions	19 " W x 28" D x 11.5" H	19 " W x 22" D x 11.5" H	19 " W x 22" D x 11.5" H
Shipping Weight	200 lbs.	150 lbs.	150 lbs.