

OWNER'S MANUAL



Hear the music, not the noise.

YOUR SUTHERLAND Ph.D.

Congratulations! You now own the quietest phono preamp you'll ever hear. Please take a few minutes to review the specifications, setting options and highlights for your easy-to-operate Sutherland Ph.D.

Although designer Ron Sutherland had already achieved Class A performance with the AcousTech Ph-1 phono preamp, he knew there was room to improve while still keeping the manufacturing cost reasonable. In designing the Ph.D., Sutherland focused on improving the purity of the power source and on lowering the background noise floor. Both goals are interrelated.

An amplifier does not make the input signal "bigger." Instead, it uses the input signal to control the delivery of power from a power supply. So the size of the output signal comes entirely from the power supply. The quality and purity of the power supply is an essential foundation for creating a high-quality output signal. Still, in many designs, the power supply is given only casual consideration.

Consider that one of the noisiest components in your home stereo is the incoming AC power. Even if it were delivered to your home as idealized 60 Hz sine wave, it would not stay that way long. One of the biggest polluters is the audio power amplifier. It does not draw current from the power line evenly. There is a large current spike drawn when the sine wave reaches its voltage extremes, while at other times current draw is essentially zero. High-frequency harmonics and noise are introduced into the same power line used for sensitive phono preamplification. There are, of course, many other factors that contribute to power line distortion and noise.

While several preamplifier designs have aimed to isolate the AC power line with varying degrees of success, ultimate power supply purity cannot be achieved without absolute elimination of the AC power line. In the case of the Sutherland Ph.D., there is no connection to the AC power line at all — period.

Instead, the power for the Ph.D. is 16 alkaline D cells. In this application, the batteries have a useable lifetime of over 800 listening hours. As they age, low-power supply impedance is maintained by high-value storage capacitance. And unlike designs that use rechargeable batteries, the Ph.D. is not compromised and encumbered with battery-charging circuitry. In fact, one of the surprising features of the Ph.D. is the absence of ANY power connections on the back panel. It is totally isolated from any outside power noise.

To bring the sonic advantages of primary battery power into a practical product required the development of a sophisticated power management system. If a conventional power switch were used on the Ph.D., it is almost certain that it would sometimes accidentally be left in the on position thereby draining the battery life much faster than necessary. Instead, Sutherland designed a power manager that monitors for a signal from the turntable, or specifically the stylus. Once a signal is detected, such as anytime the stylus is stimulated by cleaning or contacting a record, the Ph.D. will power-up for 30 minutes at which time signal monitoring is inhibited to again avoid any impact on the low-noise environment. From there, the unit automatically looks for a signal every half-hour (indicated by a yellow light flicker) for just a fraction of a second. If it doesn't find a signal, it will stay on for an additional half-hour with a yellow light indicating that it is preparing to turn off.

In designing the Ph.D., Sutherland concentrated on eliminating needless power consumption. So as very little power is used, very little heat is generated within the components. There is essentially no temperature rise and no need for "warm-up" time. The design also has very little or no dc voltage across the signal-carrying capacitors, so that dielectric forming is not an issue. If you do prefer to power-up (notice, we did not say "warm-up") the Ph.D. before listening, simply tap the cartridge headshell or brush the stylus. The unit will power-up, and you'll be set to jam!



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INDICATORS

Front panel indicators show the status of the power management circuit. When a music signal is detected, both green lights will illuminate, indicating that the unit is operating properly. Within a fraction of a second, the Ph.D. is powered-up and stable.

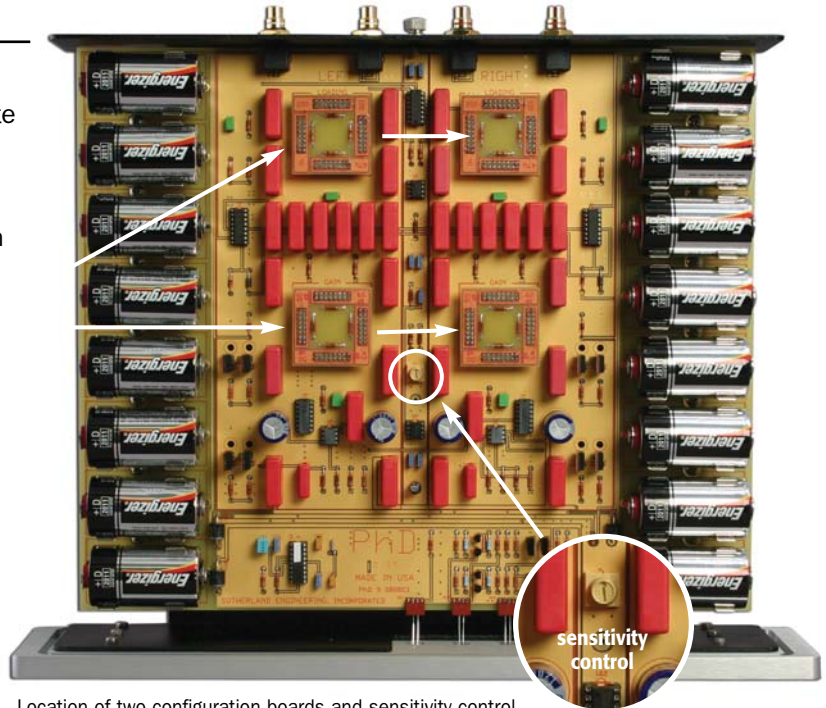
Every 30 minutes, the yellow light will briefly illuminate, indicating that the unit is checking for a continuing musical signal. If a signal is detected, power is extended for an additional 30 minutes.

The red lights indicate that the batteries are running low.

CONFIGURATION

Conventional designs use inexpensive, low-quality computer rocker switches. Their design is inadequate for configuring the low-level signal from a phono cartridge. To offer the user a wide range of configurations while maintaining signal integrity, the Ph.D. incorporates a unique plug-in configuration circuit board.

Each channel of the Ph.D. has two configuration boards: One to select cartridge loading and a second to select gain. Each board is square, and each side of the square has an associated configuration value. Settings are easily adjusted by unplugging the board and rotating it to the desired value. This approach gives the highest-quality connections with the shortest and most direct signal path. The correct orientation that the configuration board is set at is indicated by reading the board when you are facing the front of the Ph.D. unit. It will be the only number that is readable or right-side-up.



Location of two configuration boards and sensitivity control.

The Sensitivity Control sets the threshold of the signal monitor. It is set at the midpoint when shipped. Since there is quite a variance in the output voltage of phono cartridges, some adjustment may be necessary. If the Ph.D. sometimes turns itself on when there is no musical signal, reduce the monitor sensitivity by turning the control clockwise. If the Yellow light stays on while music is playing, increase the monitor sensitivity by turning the control counterclockwise.

NOTE: This control does not affect the audio circuit.

Supplied loading values:

- 100 ohms
- 200 ohms
- 1k ohms
- 47k ohms

Supplied gain values:

- 45 dB
- 50 dB
- 55 dB
- 60 dB

If you want loading or gain values that are not included in these stock values, blank configuration boards and custom configured boards are available.

CONSTRUCTION

The Ph.D. is built within a 12-gauge steel case for extreme levels of rigidity and magnetic shielding. To maintain signal integrity, the Ph.D. uses a gold-plated printed circuit board that provides a lifetime of undiminished performance.

The physical component design uses a dual mono layout so that each channel sees the same signal path, thus enabling subtle gain and phase balance between channels.

The Ph.D.'s signal path is built upon experience derived from the Sutherland PH-2000 and the AcousTech PH-1P (both Stereophile Class A components). Refinements were made to reduce the noise level in the established musicality of those designs.



The rear panel includes inputs, outputs and a ground lug, as well as the LED indicator guide and instructions for removing the Ph.D.'s cover.

Ph.D. SPECIFICATIONS and OPTIONS

Gain Settings	45 dB 50 dB 55 dB 60 dB
Cartridge Loading	100 ohms 200 ohms 1k ohms 47k ohms
Noise	Noise: Less than 150 uV 'A' weighted 47k ohms 50 dB gain Less than 400 uV 'A' weighted 200 ohms 60 dB
THD + noise	Less than 0.02%, 'A' weighted
Indicators	Green: Power On Yellow: Signal Monitor Red: Low Batteries
Size	17" wide 4 " high 14" deep
Weight	38 lbs. net (with batteries installed) 41 lbs. shipping
Power Requirements	16 Alkaline 'D' cells
Battery Life	Greater than 800 hours

Sutherland Engineering products, like those of AcousTech Electronics, are designed by Ron Sutherland for exclusive distribution through Acoustic Sounds, Inc.



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