

20/20

-a phono preamplification
instrument

by Sutherland Engineering



OWNER'S MANUAL

A note from designer RON SUTHERLAND:

I like design challenges. That is how all new products begin. This time the challenge was to offer an AC line powered phono preamp that would fit comfortably in with the Sutherland series of battery powered phono preamps. An extremely low noise floor and precise resolution was a must.

Not only was this an opportunity to creatively address AC power line isolation but to also take dual mono to a new level.

And the other design challenges: do this with extremely high performance, extremely high quality and extremely high value.

I sincerely thank my customers for giving me the opportunity to be their designer.

Ron Sutherland



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DESIGN PHILOSOPHY

Another path to the same destination.

It is a pleasure to announce a new phono preamplifier from Sutherland Engineering. It is derived from the best elements of the PH3D and the Hubble. The signal path is almost the same as the Hubble; the construction is as simple as the PH3D. It has an elegant esthetic of performance, value, craftsmanship and minimalism.

That heritage, however, does not keep the 20/20 design from taking on its own unique character.

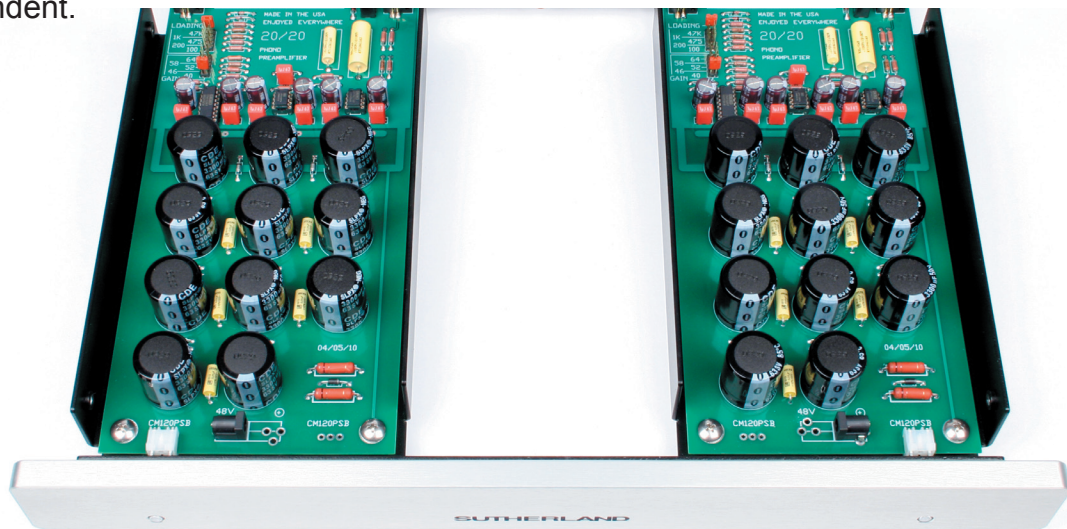
First. Everyone wants the advantages of AC power line isolation offered by battery operation. The 20/20 is for the person who wants those advantages, but does not want to mess with batteries. The 20/20 comes as close as possible to offering an equivalence of battery isolation from AC line power.

Second. Two-Mono (definition: bumping it up from dual-mono) construction. The 20/20 is literally two identical mono phono preamplifiers. Each channel is on its own circuit board, has its own shielded compartment, power indicator, its own AC power supply and its own power cord. It is the ultimate in channel separation.

AC Power, the Sutherland Way

TWO-MONO

In the quest for the ultimate in stereo separation, the 20/20 goes beyond dual mono, offering instead what I like to call “two-mono.” Many audiophiles prefer using mono-block amplification for the benefits of eliminating crosstalk and other noise contaminants associated with shared power supplies. They also prefer the benefit of each amp having its own reservoir of power, increasing dynamic capabilities, and giving the amp a sense of ease. The exact advantage can be had in a phono-preamplifier, where noise is the worst of enemies. The 20/20 may look like a conventional stereo phono stage, but take off the cover. You will discover two identical mono phono circuit boards, sharing only the same front and back panels. Power supplies, power cords, and all circuitry are separate. Even the power indicator lights are independent.



DESIGN PHILOSOPHY

POWER SUPPLIES

I don't know of any audiophile who likes power supplies that even remotely resemble 'walwarts'. The 20/20 uses not one, but two of the wallwarts more sophisticated relatives – politely called a regulated tabletop power supply.

To understand this choice, let's look at AC to DC power supply elements required for no-compromise high-end performance:

1. Rectify the AC to DC
2. Filter that DC
3. Use that raw DC to power a regulating DC to DC switching inverter (this stage also provides galvanic isolation between the AC power line and the DC load)
4. Provide additional levels of filtering to remove the high-frequency ripple from the switching inverter.
5. Provide additional levels of noise isolation from the switching inverter to the load
6. Provide local voltage regulation right at the audio circuitry.

From an engineering viewpoint, items 1, 2 and 3 can be accomplished with a well chosen, off-the-shelf table top power supply. It does those tasks well, reliably and at a very reasonable cost. The supplies included with the 20/20 are rated at a MTF (Mean Time between Failure) of over 100,000 hours. They are used at less than 10% of their rated capacity, so reliability should be even further increased. If one were to fail, replacement is simple and inexpensive. In addition to that functionality, they are already safety tested and approved for use all over the world. A great deal more time, effort and money could be spent on custom circuitry – but to no performance advantage.

From an audiophile viewpoint, it is items 4, 5 and 6 that determine the quality of DC available for the sensitive audio circuitry. That function is so important it takes up over 2/3 of each amplifier's circuit board area. Ten cascaded stages of passive RC filtering, provide an enormous distance from the pre-amp area to the incoming DC power connector. There are **over 35,000 microfarads of capacitance on each board**. The electrical 'distance' is so great, when power is first applied, it takes over 10 seconds for the power to travel thru these ten sections of filtering and reach the preamp stage. Voltage slowly ramps up until the zener diodes clamp it to the correct value. Until that voltage is reached, the audio output is muted. It is this section of circuitry that provides the extreme isolation from AC power line affects.

DESIGN PHILOSOPHY

DC CONNECTOR LOCATION

Don't be looking for power connections on the back panel. Instead, you will find them located at the front and under the cover. That is one of those form follows function decisions. The front of the circuit board IS where the power enters the circuit, therefore that is where the connector went. On your car, the gas cap is very near the gas tank. It is not located at the opposite end of the car.

Putting the entry point at the front permits power supply wires (low voltage DC) to be routed well away from all the sensitive part of the circuit. Contrast that with the AC IEC power connector (high voltage AC) conventionally located on the back panel very near the preamp circuitry and all the input/output jacks.

Beautiful On the Inside

FR-4 fiberglass circuit boards, Double-sided with plated thru holes

Dale/Vishay 1% metal film resistors

Wima Polypropylene capacitors for power supply by passing

Custom wound, 1% polystyrene film capacitors for equalization

14 gauge cold rolled steel chassis

baked epoxy powder coat finish

1/2 " thick anodized aluminum panel

front panel artwork anodized in

gold plated, Teflon insulated RCA connectors

gold plated configuration headers and sockets

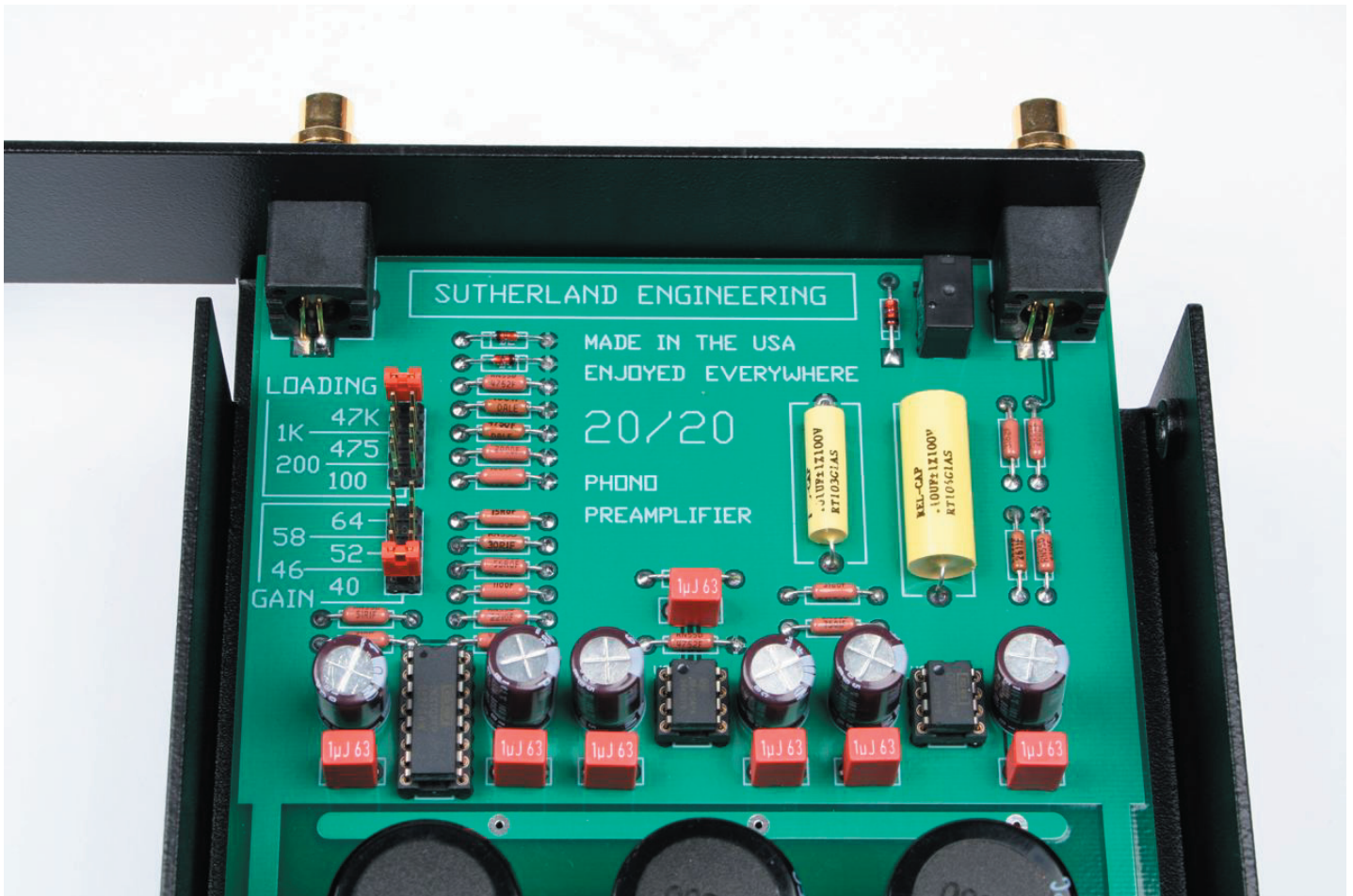
output muted during power up and power down



OPERATION

Initial Set Up

Release the top cover by removing the four knurled screws on the sides of the chassis. At the left rear of each circuit board, you will find jumpers which are clearly labeled for changing cartridge loading and gain settings. The 20/20 is shipped with a cartridge loading of 100 Ohms and a gain of 60 dB. If you wish to change those values, simply move the jumper to the correct location for each channel. Make sure that you match the loading and gain setting for each channel.



Gain Options

40 dB 46 dB 52 dB 58dB 64 dB

Loading Options

47.5 k Ohm 1 k Ohm 475 Ohm 200 Ohm 100 Ohm

20/20 specifications

Gain settings

40 dB
46 dB
52 dB
58 dB
64 dB

Cartridge Loading

100 ohms
200 ohms
475 ohms
1k ohms
47k ohms

Size

17" wide
2 ¼" high
12" deep

-external power supply (each)
5" deep
1 ½" high
2" wide

Weight

11 lbs. net
19 lbs. shipping

Power Requirements

Power: 20 watts (10 watts per channel)
Operating Voltage: 100 to 240 volts
(universal, no adjustments)



20/20

www.sutherlandengineering.com