

These brief notes should help you get the most out of your Studio Two power amp. Please read them carefully. We have tried to cover everything important, but if you desire further information, please write us.

Unpacking

Your Studio Two is packed in a double wall shipping carton and is surrounded with protective foam. The serial number on the carton should match the number on the warranty card and on the back panel of the unit. We urge you to save all the packing material in case you should find it necessary to ship your Studio Two in the future.

Inspect the unit for any signs of physical damage. Each Studio Two is carefully inspected at our plant and certified to be free of defects. Any damage is the responsibility of the freight carrier and should be reported to them immediately, as there are definite time limits for making claims.

We can not ensure you proper warranty service unless you fill out the warranty card completely and return it promptly. We would also like to hear your opinion of the Studio Two and learn what other components you are using it with.

Installation

The Studio Two may be placed anywhere where there is adequate air circulation past the heat sink fins on the front of the unit. Since the Studio Two weighs about 30 pounds, you will need a fairly sturdy table or shelf. Placement relative to the other components in the system is non-critical, but be sure your preamp is capable of driving the cable connecting it to the Studio Two if the distance is over six feet. Do not route low level audio cables near the power transformer area at the right rear of the Studio Two.

During low power operation the Studio Two becomes warm. If you have low efficiency speakers, or if you listen at high volume levels, the heat sinks may become quite hot. Should the temperature run too high, the thermal cutout will activate, removing AC power from the amp. Try to keep the Studio Two as cool as possible, since heat reduces the usable life of any component. Ideally, the Studio Two should be placed on a hard, open surface with unrestricted air flow. Extending the fins over the edge of the table or shelf will aid the cooling. If air flow around the Studio Two is restricted, or if it is driven hard for long periods of time, a cooling fan may be required.

The Studio Two can be rack mounted on standard 3½" centers with an optional rack mount kit. The end panels are removed, and rack mount brackets are added, making the overall width 19".

Interconnections

Figure 1 shows the Studio Two used in a typical system situation. All connections should be made with the AC power disconnected.

The output binding posts of the Studio Two are mounted on a standard ¾" spacing, so quick disconnect banana plug connectors can be used. We recommend 16 gauge stranded wire for speaker connections. This is essential for lines over 20 feet or for 4 ohm speakers. The red terminal of each channel should be connected to the + terminal on each speaker, and the black terminal to the - terminal on the speaker. The Studio Two has a common ground point at the rear panel, so the black terminals are equivalent. When you connect the speakers, make sure that no strands of wire short any of the output terminals. Check for possible shorts at the speakers, too.

Operation

The Studio Two has no controls and is intended to be used with a preamp or as part of a larger system. Full power is achieved with a 1.2 VRMS input into either 8 ohm or 4 ohm loads. When AC power is applied, the Studio Two begins operating immediately. There are no delay circuits or relays. The amplifier outputs are connected directly to the output terminals. Due to its symmetric design, the Studio Two is virtually silent during turn-on and turn-off. When AC power is removed the amplifier continues to operate for several seconds. Make sure the power is drained from the amp before disconnecting the input cables. Wait until the pilot lamp stops glowing. If the Studio Two turns off due to excessive heat, disconnect the AC power and allow the amp to cool. If overheating occurs repeatedly, the source of the problem should be located and corrected. The Studio Two is short circuit protected, but a partial or dead short at the output will cause it to gradually overheat and turn off.

Bridging

Mono operation in the bridging mode requires a simple modification to the Studio Two. This can be done at the factory or at an authorized service center. The minimum load impedance for bridging operation is 8 ohms. Clipping occurs at 350 watts RMS, THD is no more than 0.04% from 20-20,000 Hz at 320 watts RMS into 8 ohms.

Circuit Description

The Studio Two is a modular 80 watt per channel stereo amplifier. The channels are totally separate, wired on plug-in modules, and share a common dual transformer power supply. The supply voltage is ± 50 VDC filtered by dual 16,000 uf capacitors.

The amplifiers feature an all discrete, direct coupled, balanced design. A paralleled complementary Darlington output stage is used with carefully matched differential stages for the low level amplifiers. A true differential to single ended conversion is used with no bootstrapping to insure symmetric performance and fast recovery characteristics. A special active bias circuit shows a slightly negative temperature characteristic, keeping distortion independent of bias current and operating temperature.

Internal slew rate exceeds 100V/microsecond. Response is flat from 0.02 Hz to 2 MHz. The terminal response is purposely limited, however, and drops 3 dB at 1 Hz and 200 KHz. This assures that the amplifier can easily handle any signal that reaches it. The Studio Two has a common input and output ground point at the rear panel. This simplifies system connections by eliminating ground loops and improves RF rejection. A unique output coupling network prevents RF from entering via the speaker lines and improves load stability.

In addition to primary fusing, the Studio Two has dual supply fusing on each channel. A thermal cutout is also provided. Four output transistors per channel give the Studio Two excellent safe area capability, but an additional high gain and fast recovery volt/amp protection circuit is included for an extra safety margin. Due to the excellent safe area characteristics the protection circuit requires no storage or memory capability and therefore activates and recovers instantaneously.

Many of the specific circuits used in the Studio Two were selected for sonic as well as technical reasons. The Studio Two's high sonic accuracy is a result of taking the time and energy to thoroughly analyse every aspect of the circuit both technically and sonically.

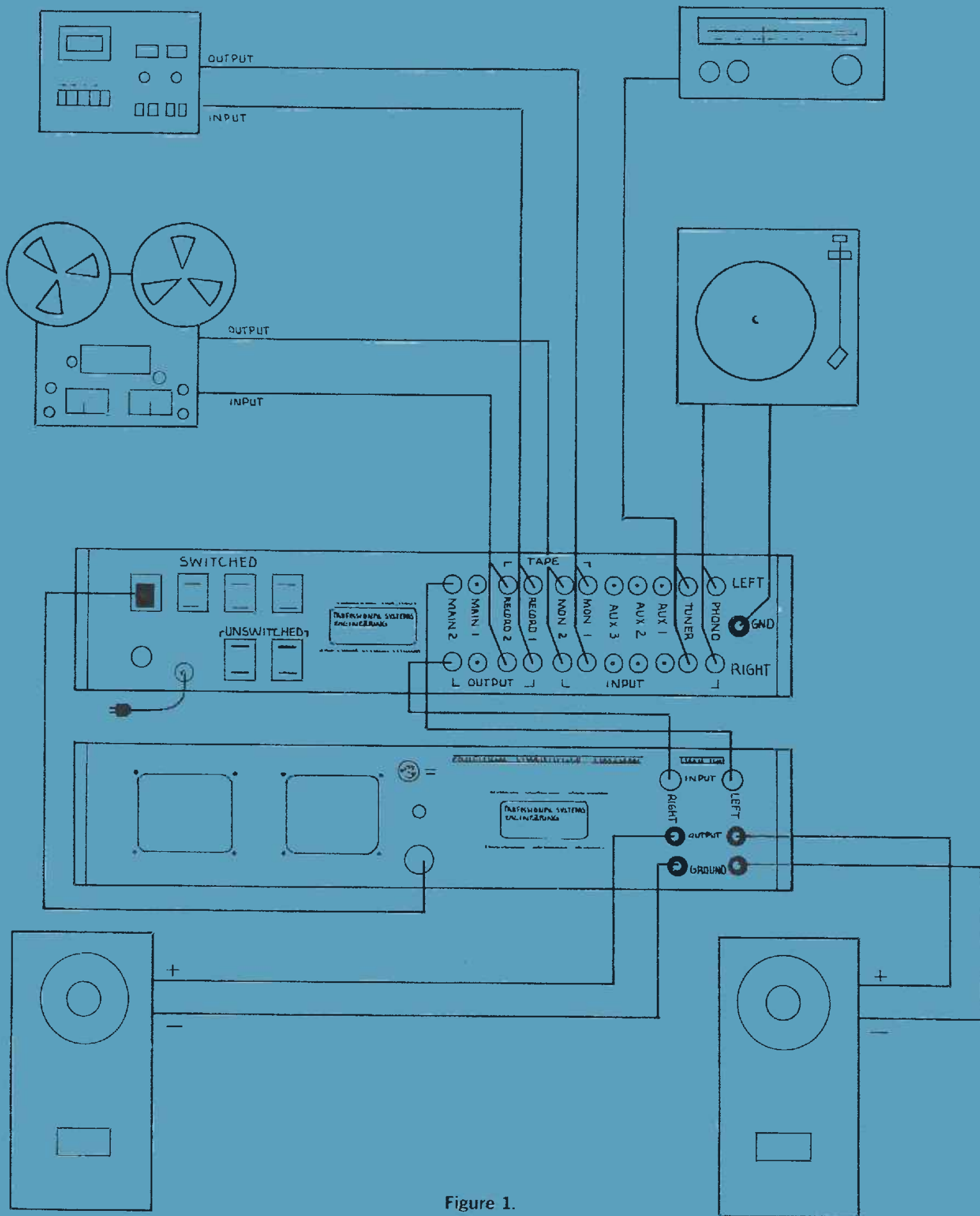


Figure 1.

In case of trouble

If you have trouble with your Studio Two, we are ready, with your help, to correct the problem. There are a few things you can do to help us remedy the situation as quickly as possible.

Check to be sure that the Studio Two is the cause of the problem. If the pilot lamp does not light, check the fuse. A blown fuse can be replaced with either a 4 amp slow blow type (2 amp for 220 volts) or a 6 amp fast blow type (3 amp for 220 volts). If the fuse blows again immediately, contact an authorized service center before trying again. Never use other than the specified fuses.

If you experience trouble in one channel only, switch the input cables left to right at the Studio Two. If the problem changes channels, the preamp or the source component is at fault. If the problem stays in the same channel, switch the speaker connections left to right. If the trouble changes channels this time, the Studio Two is at fault. If you can't locate the source of the trouble, or if you determine that the Studio Two is at fault, we'd like you to take some careful notes on the problem. This information will make it much easier for us to service your unit and get it back to you quickly. Please include the answers to these questions when you send the unit in for service.

1. Does the problem occur constantly or intermittently?
2. If you have intermittent trouble, how often does it occur? For how long?
3. What channel is affected?
4. What are the symptoms in detail?

All units returned for service must be packed in the original carton, whether returned to the factory or to a local service center. The factory will not accept units for service unless they are packed in the original packing material.

Additional shipping cartons are available from the factory for \$8.00. If you prefer to have warranty service done by the factory, ship your unit to us insured and freight prepaid. We will return it to you freight prepaid within the 48 states. We are sorry but we cannot accept parcel post shipments.

Shipping address:

Professional Systems Engineering
2021 West County Road C
St. Paul, Minnesota 55113

Maintenance

The Studio Two is designed for trouble free operation. The only things that might need periodic attention are the hardwood end panels and the exterior of the unit.

The end panels are stained and oiled at the factory. To maintain their appearance, we recommend the occasional light application of a quality furniture oil. The panels can easily be removed for this purpose.

Simply dusting the top plate and front fins is usually sufficient for cleaning the exterior. For stubborn stains we recommend a window cleaning spray and a soft cloth. Protect the end panels from water stains. Never use a wax preparation or an abrasive cleaner on the chassis or heat sinks.

professional systems
engineering, inc.

2021 west county road c
saint paul, mn 55113

limited warranty

Professional Systems Engineering, Inc. warrants its products to be free of manufacturing defects for a period of three years. Professional Systems Engineering, Inc. or an authorized servicing agent will replace or repair defective components, modules, or units with equivalent new or rebuilt components without charge to the original owner subject to the following conditions and exclusions:

Conditions

1. Purchaser must return to Professional Systems Engineering, Inc. within 15 days of the original date of purchase a completed warranty registration card for validation. Information on the card must be complete and legible.
2. All warranty claims must be accompanied by the validated registration card and proof of purchase.
3. Warranty service is available only at authorized Professional Systems Engineering service stations.
4. All units returned to Professional Systems Engineering or its agents for repair must be packed in an original shipping carton.
5. All shipping costs must be prepaid and full insurance provided. All shipping costs and loss or damage claims are the responsibility of the purchaser.

Exclusions

1. This warranty does not cover defects or damage resulting from accident, misuse, abuse, lack of reasonable care, or normal wear.
2. This warranty is void if the serial number is defaced, altered, or removed.
3. This warranty is void if the unit is altered in any way. This includes the attachment of any accessory item or other component in other than the specified manner.
4. Warranty claims arising from improper service performed by any servicing agency are excluded.
5. This warranty is extended to the original registered owner only.
6. Damage caused by or to accessory items or other components associated with or connected to Professional Systems Engineering equipment is not covered under this warranty.
7. Professional Systems Engineering, Inc. is not responsible for accessory items shipped with equipment returned for warranty service.
8. This is not a service contract. This warranty does not cover cleaning, maintenance, and periodic check-ups.
9. Professional Systems Engineering, Inc. reserves the right to make changes and improvements in its products without any obligation to include these changes in previously manufactured units.
10. This warranty does not cover replacement of external fuses or apparent failures arising from improper operation, or incorrect interconnection of components, or incompatibility with other components or accessories.

Professional Systems Engineering, Inc. reserves the exclusive right to determine eligibility for warranty service under the conditions and exclusions stated above.

Except to the extent prohibited by applicable law, all implied warranties made by Professional Systems Engineering, Inc. in connection with this product, including warranties of merchantability or fitness, are limited to the warranty period set forth above, and no warranties, whether expressed or implied, including warranties of merchantability or fitness, shall apply to this product after said period has expired. The consumer's sole remedy shall be such repair or replacement as is expressly provided above; and under no circumstances shall Professional Systems Engineering, Inc. be liable for any loss or damage, direct or consequential, arising out of the use of, or inability to use, this product.