



**KRELL**<sup>®</sup>  
DIGITAL



## **STUDIO 2 DIGITAL TO ANALOG PROCESSOR**

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**OWNER'S REFERENCE**

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# INTRODUCTION

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Thank you for your purchase of the Krell STUDIO 2 Digital-to-Analog Processor and welcome to the Krell family of audio components. Krell is dedicated to the development of technologically advanced components for the reproduction of digitally recorded music. The STUDIO 2 continues the Krell tradition of uncompromising performance through leading-edge technology.

To obtain the best performance from your STUDIO 2 Processor, careful attention should be paid to its placement, installation and operation. A thorough understanding of these details will help insure satisfactory operation and long life for the STUDIO 2 and related system components.

This Owner's Reference is divided into several sections which describe the features and functions of the STUDIO 2. A Question and Answer section is included to provide answers to common questions. Should you have any questions or suggestions, please feel free to contact your authorized dealer or the KRELL staff for assistance.

In the unlikely event that your STUDIO 2 should require service, you will be pleased to know that it is backed by a comprehensive Customer Satisfaction policy and one of the most advanced service facilities in the industry. For detailed information on the terms and conditions of service, please consult the Warranty and Service section of this Reference, Warranty Registration Card, or authorized KRELL Dealer/Distributor.

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## UNPACKING INSTRUCTIONS

1. Open the box and remove the top layer of foam. The following items will now be visible:

- 1 STUDIO 2 D/A Processor
- 1 AC power cord
- 1 Packet containing the Owner's Reference and Warranty Card

NOTE: If any of these items are not included, please contact your authorized dealer immediately for assistance.

2. Carefully remove the STUDIO 2 from the box. Remove the protective plastic wrap from the Processor.

NOTE: Save all packing materials. If you must ship your STUDIO 2 in the future, repack the unit in its original packaging to prevent transit damage.

## **PLACEMENT**

Before you install the STUDIO 2 into your system, we recommend that you follow these guidelines in choosing the location. This will facilitate a clean, trouble-free installation.

1. Although well shielded, the STUDIO 2 should not be placed in close proximity to hum-sensitive components (i.e. preamps, turntables, tuners, etc.) that can create interference and induce hum.
2. As with any high quality component, ensure that the vent openings in the chassis are free from obstruction, allowing the Processor to dissipate heat created by its power supply and Class A output stage. Place the unit on a clean, level surface away from excessive dirt or moisture. Make sure the STUDIO 2 has at least 2 inches of clearance on either side and 2-3 inches of space at the top. Components that are heat sensitive should not sit directly above the unit.
3. The STUDIO 2 does not require additional mass coupling or isolation. You may experiment with feet or cones as long as they do not permanently affix to the chassis. Any unauthorized modifications to the electronics or chassis will void the warranty.

## AC POWER CONSIDERATIONS

NOTE: While the STUDIO 2 has superb regulation and does not require a dedicated AC circuit, we strongly advise against any connections through extension cords or multiple AC adaptors. High quality 15 amp grounded AC strips are acceptable. High quality AC line conditioners or filters can be utilized if they are grounded and meet or exceed the unit's power supply rating of 150VA.

CAUTION: Do not remove or bypass the ground pin on the end of the AC cord. This may cause RFI (radio frequency interference) to be induced into your playback system.

## INPUT AND OUTPUT CONNECTIONS

**CAUTION:** When making connections to this component or any other, make sure the power amplifier is OFF and the preamplifier is in the MUTE or STANDBY mode.

1. Connect the power cord to the back of the STUDIO 2 and plug the unit into the wall AC receptacle.
2. Connect the STUDIO 2 analog output to the line level input of your preamplifier.

The STUDIO 2 is equipped with two analog output configurations: Single-ended via RCA connectors and balanced via XLR connectors. If your preamplifier has high level balanced inputs, we recommend the balanced outputs of the Processor be used. There are considerable sonic benefits associated with the use of balanced interconnection.

The XLR pin configuration is described below.

Pin 1	Ground
Pin 2	Non-inverting (0°)
Pin 3	Inverting (180°)

**NOTE:** The two outputs can be used to simultaneously feed different systems.

**NOTE:** If you decide to use the single-ended analog outputs, the type of interconnect cable should be chosen carefully. High quality shielded cable is suggested.

## CONNECTIONS

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3. The Left and Right channel RCA outputs are labeled on the back panel. The balanced outputs are not labeled. The balanced connector closest to the Left RCA output is for the left channel output and the connector closest to the RCA right output is the right balanced output. Care should be taken to insure that the channel orientation between the Processor and the high level inputs of your preamplifier is maintained.

4. Connect the digital output of your CD transport and other digital sources to the inputs of the STUDIO 2. If you are using multiple digital sources, take note of where each input and corresponding switch setting is located.

The STUDIO 2 is equipped with the following inputs: two coaxial, one AT&T wide bandwidth fiber optic, standard TOSH fiber optic, and one AES/EBU. All inputs can accept a signal from any digital source such as Compact Disc players, Laser Disc players, DATs or satellite receivers. When a powered digital source is introduced to an input and that input is selected with the specific Input switch, the corresponding signal LED will illuminate. When the source and the Processor have locked the SYNC indicator LED will illuminate.

The STUDIO 2 has a provision to add an additional AT&T input. The second AT&T input will replace the Coax 2 space on the back panel and is selected by the COAX2/ST input switch. For further information contact KRELL.

NOTE: If the digital source is ON and the signal LED does not illuminate, check to make sure the digital interconnect cable is secure at both ends or is not in need of repair.



5. Once you have completed the necessary input and output connections, select the input of your choice. For each input selected, the corresponding LED will illuminate. When a powered digital input source and the Processor have linked, the SYNC LED will illuminate.

### **DIGITAL SOURCE TO D/A PROCESSOR INTERLINK CONSIDERATIONS**

Care should be taken in selecting the type of cable used to link the digital source to your Processor. We suggest the AT&T wide-bandwidth fiber optic cable be used. The AT&T format has a bandwidth of approximately 50 MegaBit. This allows accurate transmission of the digital bit stream without data corruption and proves to be sonically superior. If the AT&T format is not available, a high quality quartz fiber optic cable (TOSH format) can work well. Using a fiber optic interconnect reduces ground loop problems often associated with quality audio systems.

If coaxial cable is used, it should be non-capacitive and have a bandwidth in excess of 10MHz to prevent drop-out errors. For best results with coaxial cable we recommend the AES/EBU balanced format. The AES/EBU format is a  $\pm 5$  volt balanced digital transmission. Because of the high voltage balanced format, this system allows for accurate data transmission and has great sonic advantages over standard single-ended coaxial or Tosh fiber optic terminations. The AES/EBU coaxial cable must have two conductors and a shield for balanced termination.

# CONNECTIONS

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How to connect AT&T cables:

- a. Remove the plastic cover from the outside of the AT&T transmitter (located on Transport) and receiver (located on Processor).
- b. Locate the slot on the top of the AT&T receptacle.
- c. Locate the key on the top of the AT&T cable.
- d. Remove the plastic cap from both ends of the fiber optic cable.
- e. Slide the cable connector into the AT&T receptacle with the key sliding into the designated slot.
- f. Gently push the connector into place, depressing the internal spring, and twist the outer collar clockwise to secure the connection.

## **INPUT SELECT SWITCHING**

The STUDIO 2 has multiple digital inputs. Each input has its own input switch and direct path to the digital Processor. When an input is selected, the corresponding LED will illuminate.

AT&T	AT&T fiber optic input
TOSH	Toshiba fiber optic input
XLR	Balanced AES/EBU digital input
COAX1	Coaxial input
COAX 2/ST	Coaxial input or Optional-2nd AT&T ST input

## **SYNC INDICATOR**

When the input signal locks with the Processor, the SYNC LED will illuminate. The input frequency is automatically selected by the Processor. As an example, if you select the AT&T input from a CD transport, the 44.1 KHz frequency will automatically be selected and the SYNC LED will illuminate. The STUDIO 2 will accept and automatically adjust to 38.0 KHz, 44.1 KHz, and 48.0 KHz input frequency signals.

## **0° and 180° PHASE SWITCHING**

The absolute output phase of the STUDIO 2 can be changed. In some recordings the master tape was recorded out of phase, creating unusually poor sounding recordings. The STUDIO 2 can shift the absolute output phase 180° to correct for this anomaly. To change the phase from 0° to 180°, press the 180 DEG button. To change back to normal phase, press the 0 DEG button. Utilizing the Phase Switching can, in some instances, restore life to a previously dull sounding recording.

## **EMPHASIS LED**

Emphasis is a recording technique that accentuates the treble region of recorded music. Discs and/or Tracks that were recorded with Pre-emphasis will cause the Emphasis LED to illuminate. When the Emphasis LED is lit, the appropriate complementary circuitry (De-emphasis) is activated to provide a flat output response.

## OPERATING INSTRUCTIONS

1. Select an input with the Input switch. Notice the Signal LED will illuminate when the digital source is turned on and has linked with the Processor. Once this link is complete, the Processor is ready to pass a signal.
2. Be sure that your preamplifier volume control is turned completely to the OFF (lowest volume) position.
3. Turn ON your components, remembering that the last component to be energized should be your amplifier. The amplifier should only be turned ON after all other components in the system have been on for at least two minutes. This will insure that no large pulse will be created when the amplifier is turned on.
4. Switch the source selector of your preamp to the position correlating to your chosen input connection for the STUDIO 2.
5. You may now start playing your digital source, DAT, CD or satellite.
6. Slowly turn the volume control up to the lowest level you can hear. Check to see that both channels are working correctly before advancing the volume.

## OPERATION

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NOTE: While your STUDIO 2 will perform beautifully from the moment you turn it on, it requires a minimum warm-up period of 8 hours before it begins to show its strongest sonic qualities. It will continue to improve over time. Discrete components are utilized in the analog output stage and the warm-up period allows them to reach thermal equilibrium.

Your installation is now complete. Should you have any further questions which are not covered in the remainder of this Reference, contact your authorized Krell dealer. We wish you many hours of listening fulfillment.

Q. My CD player has both fiber optic and coaxial outputs. Which one should I use?

A. Given a choice, we prefer the AT&T optical link due to its ability to completely isolate the grounds between the digital source component and the Processor. This minimizes the possibility of ground loops in the digital components. The AT&T format also has the added benefit of substantially higher bandwidth than coax or the standard fiber optic interface. If a coax cable must be used, we suggest the AES/EBU balanced format. This interconnection utilizes a  $\pm 5v$  digital format and the additional benefit of balanced termination.

Q. Will I damage my STUDIO 2 if I leave the power "ON" all the time?

A. No. The Class A discrete analog circuits perform more consistently once they reach thermal equilibrium. This Processor has been designed to be left On at all times. The STUDIO 2 draws less than 30 watts out of the AC mains socket.

NOTE: For the protection of your Processor, we recommend disconnecting the AC cord from the wall outlet before any electrical storms or if you plan on being away from home for prolonged periods of time.

## QUESTIONS AND ANSWERS

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Q. Do I have to switch the Sampling Frequency when I go between my CD and DAT?

A. No. Your STUDIO 2 automatically senses the input frequency and does all necessary switching.

Q. I am not getting any sound through the Processor. What could be wrong?

A. Most likely there has been a simple mistake in installation. Check all connections IN and OUT of the Processor. Is the digital source component powered? Check all power connections. Have you selected the correct source on the STUDIO 2 and preamp? Check the front panel LED's for power supply stability. If you still have no sound, turn off the power and contact your dealer.

Q. I have some very fine audiophile interconnect cable which has superior sonic characteristics. Can I use this for my coaxial digital input?

A. You may experiment with any high quality cable. Do note that most audio interconnect cable is not designed to carry the ultra-high frequency information of the digital bit stream.

NOTE: For the STUDIO 2, we recommend non-capacitive coaxial cable which has a bandwidth in excess of 10MHz and excellent shielding properties.



Q. While listening to my STUDIO 2 I experience occasional periods of silence through my speakers. Is my Processor malfunctioning?

A. Drop outs are caused by two primary reasons. First, drop outs can be caused by data corruption. Corruption in the data may be due to a poor input connection, damaged or dirty source material, or interconnects which do not have wide enough bandwidth. The second item that causes the Processor to reset is the presence of a transient spike on the incoming AC power line. The Processor is resetting all of its digital processing circuits so that it can be assured that all are properly synchronized. Try changing your source material and check your connections. If these are not the cause, speak with your dealer about obtaining different cabling. If you are using fiber optics, and source material and connections are not the problem, speak with your authorized dealer.

Q. Since I installed the Processor in my system I have a low level hum that increases as I turn up the volume. There was no hum in my system until I added the Processor. Is the Processor malfunctioning?

A. The fact that there was no hum in your system until you added the Processor indicates that you have a ground-loop problem. Often changing the interconnect to a fiber optic cable will eliminate this problem. The way the digital Processor and digital source are connected to the AC mains often can be the cause of grounding problems. Check for loose interconnect cables and or bad electrical connections. Consult your dealer or Krell for individual system suggestions if this hum persists.

# SPECIFICATIONS

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## FREQUENCY RESPONSE

-.3 dB@ 20KHz and at 8Hz

## SIGNAL TO NOISE

≥ 115dB

## DIGITAL-TO-ANALOG CONVERTER

18 bit

## PROCESSING

1 Motorola DSP-56001

Upgradable software contained in socketed EPROM.

## LINEARITY

± .3dB at -90dB

## THD +N

.0025% -92dB

## CHANNEL SEPARATION

≥ 109dB

## ANALOG OUTPUT VOLTAGE

2.00 volts

## DIMENSIONS

19.00" WIDE

12.50" DEEP

2.50" TALL (with feet)

## SHIPPING WEIGHT

16 pounds

### WARRANTY AND SERVICE INFORMATION

There are no user-serviceable parts inside the STUDIO 2. The STUDIO 2 has a limited warranty of five years parts and labor. Return freight is included in the warranty. The warranty period begins on the date of purchase and is activated with the return of the enclosed Warranty Card and a copy of the Sales receipt. Please return the Warranty Card immediately after successful installation and operation are completed.

The warranty for Krell products is valid only in the country to which they were originally shipped and at the factory. If you think there are problems with your unit, please contact your dealer, distributor or the factory immediately.

The operating voltage of this unit is determined by the factory and can only be changed by an authorized KRELL distributor or the KRELL factory. Any unauthorized voltage conversion will void the warranty. Should the operating voltage of your STUDIO 2 require changing, contact KRELL Industries.

Please do not return any unit to KRELL for repair without first calling to discuss the problem and to obtain a Return Authorization number. Freight to the factory or distributor is your responsibility. Return freight to you will be paid by the factory or distributor. Any unauthorized disassembly, updates or modifications performed to the unit will void the warranty.



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