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MASTER REFERENCE AMPLIFIER

OWNER'S REFERENCE

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Master Reference Amplifier Owner's Reference, v99.0

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CE

This product complies with the EMC directive (89/336/EEC) and the low-voltage directive (73/23/EEC).

WARNINGS

The amplifiers must be placed on a firm, level surface where they are not exposed to dripping or splashing.

The ventilation grids on the top of the amplifiers and the space underneath the amplifiers must be unobstructed at all times during operation. Do not place flammable material above or beneath the amplifiers.

Before making connections to the amplifiers, ensure that the back panel power switch is down on each amplifier. Make sure all cable terminations are of the highest quality, free from frayed ends, short circuits, or cold solder joints.

The differential circuitry employed with Master Reference Amplifiers requires special attention when connecting speakers. Do not connect the negative speaker terminals together. Do not connect the negative speaker terminals to ground.

Do not connect a Master Reference Amplifier to a speaker selector device that employs a common ground scheme, as it may short-circuit the amplifier output.

THERE ARE NO USER SERVICEABLE PARTS INSIDE THE MASTER REFERENCE AMPLIFIERS.

Please contact Krell if you have questions not addressed in this guide.

This product is manufactured in the United States of America. Krell® is a registered trademark of Krell Industries, Inc., and is restricted for use by Krell Industries, Inc., its subsidiaries, and authorized agents. Sustained Plateau Bias II™ is a patent of Krell Industries, Inc. Krell CAST™ is a trademark of Krell Industries, Inc. Krell Current Mode™ is a trademark of Krell Industries, Inc. Krell Link™ is a trademark of Krell Industries, Inc. All other trademarks and tradenames are registered to their respective companies.

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P/N I960601900101

A Letter from Dan D'Agostino

Dear Audio Enthusiast,

Thank you for your purchase of the Master Reference Amplifiers and for choosing to join my personal quest for a pair of amplifiers that have no rival.

I have been involved in the design of audio products for over thirty years. During that time I have worked with all types of components, from cartridges to digital sources, from integrated two-channel speaker systems to highly complex theater systems. Throughout my career, however, I have always been fascinated by high power amplifiers. I believe that no other component in an audio system equates more closely the full range of musical expression than the power amplifier. It must deliver absolute accuracy from extremely low levels of output, virtually at preamplifier levels, to astounding, almost frightening amounts of power. And, of course, it must be able to do this with the wide range of loads that loudspeakers present.

From the first Krell product, the KSA–100, I have attempted to create power amplifiers of higher power and greater resolution than previously available. Each new line of amplifiers I have released has delivered increased power and resolving capability, as new technology has been developed and new materials have become available.

The Master Reference Amplifiers are the latest evolution of my passion for the research and development of reference caliber, high power, high resolution monaural amplifiers. Nothing excites me more than creating and using amplifiers capable of generating near-lifelike sound pressure levels, tonal accuracy, and resolution of detail. There are now three generations of this class of amplifier, and each has represented the most in-depth execution of available technology. With the Master Reference Amplifiers, I have combined the latest generation of control software with innovative circuitry to create a component which provides unlimited power with absolute accuracy for the ultimate control of any loudspeaker.

The very nature of the Krell Master Reference Amplifiers dictates that only a limited number will ever be produced. They are reserved for the passionate few. Thank you for appreciating my art.

Sincerely,

Daniel D'Agostino
Chief Executive Officer

Definition of Terms

Krell CAST	Current Audio Signal Transfer (CAST) is a Krell technology for connecting analog components that provides the most accurate signal transfer from one component to the next and eliminates cable interaction.
Krell Current Mode	A topology designed by Krell and used in amplifier input and output stages to ensure accurate signal representation.
Krell Link	A method of connecting multiple components and synchronizing their stand-by/operational modes.
Off	The power breaker switch on the back panel of the amplifier is in the down position when the amplifier is off.
Stand-by	A low power consumption status that keeps the audio and regulator circuits at idle.
Operational Mode	The amplifier is in the operational mode when it is ready to play music.
Sustained Plateau Bias II	A digital circuit that controls amplifier bias based upon a variety of conditions. Sustained Plateau Bias II ensures amplifiers are always in Class A mode, while simultaneously minimizing power consumption and heat generation.

The Krell Legacy

"I design every Krell music system to set the standard for workmanship, style, and performance."

Dan D'Agostino

High-end audio is a demanding pursuit — an ongoing quest for excellence in music reproduction that drives equipment manufacturers to strive for ever higher levels of execution in design and performance. With a keen understanding of this passionate drive, Krell Industries, Inc. was founded in 1980.

Over the past two decades, Krell has earned a distinguished reputation for engineering innovation and product excellence. The company's history is replete with product introductions that have deeply impacted the high-end audio industry. Krell components have consistently been recognized for standard-setting performance by the most discriminating audiophiles and product reviewers.

The Master Reference Amplifier is an unequivocal statement of the Krell mission. It delivers a listening experience that transcends all previous amplifier designs in sheer musical power and emotional impact. In doing so, it extends a tradition that began with the first Krell amplifier — the KSA–100.

The KSA–100 was the first high-power, high-current, true Class A biased stereo power amplifier available to audiophiles. It was Krell's first product, and its resounding success established Krell as an important new technological contributor to high-end audio.

From the KSA–100 to the present, Krell C.E.O. Dan D'Agostino has continually "pushed the envelope" of performance in his search for greater amplifier power. His exploration of new technologies, driven by his never-ending quest to elevate the standard of excellence, has resulted in breakthrough audio designs. Over the years, the Krell line of power amplifiers, including benchmark products such as the KRS–100, KRS–200, and the Audio Standard models, has established a legacy of unparalleled sonic performance.

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The Krell product line has diversified, but Dan's fundamental research into amplifier design and performance remains at the core of the company's achievements. Every Krell component upholds the legacy, incorporating unique technologies that are the direct result of Dan's discoveries in audio amplification.

The Master Reference Amplifiers build on the Krell legacy. They provide a super-abundance of power with unprecedented control and accuracy, ensuring maximum performance with any loudspeaker system. The listening experience is elevated to new heights with dynamic realism and an unconstrained sound quality that are unprecedented.

Dan D'Agostino remains committed to the development of new designs and technologies. His voyage continues. And the Krell legacy will continue to evolve with products that deliver innovative engineering, perfection in build quality, and outstanding audio performance.

Before you power up...

The latest chapter of the Krell legacy is about to unfold in your listening room. Countless hours of excitement and exhilaration await, and we know you are eager to get started. Please, however, read this Owner's Reference carefully before proceeding. A thorough understanding of the Master Reference Amplifiers' operation and technology will enhance your enjoyment and ensure enduring satisfaction from your entire system.

Revolutionary Krell CAST Technology

The Master Reference Amplifiers are designed with Current Audio Signal Transmission circuit technology, termed CAST. This circuitry is a revolutionary method of connecting analog audio components for unparalleled sonic performance. The innovative use of the new Krell CAST in combination with existing Krell Current Mode technology enables you to create entire CAST systems that reproduce music with incredible range, tonality, and precision.

The Traditional Audio System and Voltage Signal Transmission

Signal is transmitted in the voltage domain between two components in a traditional audio system. Each component is a discrete entity displaying unique characteristics that affect the musical signal independently. Each component is unaware of the other components in the system. The cables that connect the components also have their own electrical characteristics that affect the sonic presentation of the audio system.

A New Approach: Current Audio Signal Transmission

CAST circuitry recognizes signal transmitted between each component in the current domain instead of the voltage domain. CAST transmission unifies individual components and their interconnects into an electrically linked whole. The sonic presentation of the entire system remains intact.

The Basics of CAST

Here's how a CAST audio system works with the Master Reference Amplifiers. Each CAST source amplifies current internally, using Krell Current Mode circuitry. CAST circuitry then outputs this current signal. When the signal is received by a CAST input on a Master Reference Amplifier, Krell Current Mode circuitry again manages the signal until the signal reaches the loudspeaker. An entire CAST system behaves as if it is one component because it maintains the musical signal in the current domain from beginning to end. Anomalies of signal transmission between components are eliminated. Cable impedances and their effects on the transmitted signal are non-existent.

CAST and Krell Current Mode Combined

CAST combined with Krell Current Mode takes circuitry signal transmission to the next evolutionary level in signal transmission. Krell Current Mode is the technology developed to transfer the musical signal within a component, used in Krell components since 1995. Krell has now added CAST technology, a new method of transferring the musical signal between components. In essence, Krell Current Mode maintains the integrity of the signal within the Master Reference Amplifiers and CAST preserves the transmitted signal between source components and the Master Reference Amplifiers. Together, CAST and Krell Current Mode technologies unify separate Krell components into a *single global circuit*.

CAST Cables

CAST systems use cables manufactured by Krell and other manufacturers who are specially licensed by Krell. Thin, flexible CAST cables are constructed with the same build quality as Krell components and are aesthetically matched to the Krell product line. An all-metal body and locking connectors with gold contacts are part of the no-compromise specification developed as the standard for every CAST cable made.

The Best Musical Performance

A CAST system brings you significant improvements in every performance area: speed, precision, dynamic range, depth and width of the sound stage, transient impact, tonal balance, harmonic distortion, and more. The goal behind designing CAST into the Master Reference Amplifiers reflects the company goal for every Krell product. Krell strives for the delivery of the best performance of a musical event for you, using the full expression of technology to date.

Thank you for your appreciation of our research and development effort.

Ensuring Maximum Performance

The function of each Master Reference Amplifier is to emulate a pure voltage source that provides unlimited current and an extraordinary amount of accurate power into any impedance, ensuring maximum performance from every loudspeaker system.

The Master Reference Amplifiers bring a new level of performance to sound reproduction. Features that make these amplifiers the largest and most powerful ever built include innovative technology for controlling the vast power the amplifiers generate. In addition, in the engineering and design of the Master Reference Amplifiers, we have enhanced our core technologies, developed for all Krell components, for exceptional power, control, and performance.

Innovative Software-based Power Control

The Master Reference Amplifiers set a new standard for output drive, assuring that no matter how much power is needed, it will always be available and appropriate. Software-based control is critical to managing this power, using an onboard microprocessing module unique to each Master Reference Amplifier. This software key optimizes all amplifier functions, assuring maximum performance from any loudspeaker. Microprocessor-controlled, fully active regulation enables the Master Reference Amplifiers to develop full power into the most demanding loudspeakers. This circuitry continually monitors and adjusts the power source to compensate for even the smallest variation in current or voltage from the AC power line.

Core Krell Technologies

Sustained Plateau Bias II™ Circuitry

Class A operation is by far the most desirable for performance, but traditional Class A circuitry can cause reliability problems along with environmental and thermal concerns. The Master Reference Amplifiers employ Class A operation managed

by Sustained Plateau Bias II circuitry, a digitally controlled circuitry that is extremely precise under all conditions: Performance characteristics do not change over time.

In this remarkable circuitry, the amplifiers analyze the musical signal as well as the loudspeaker impedance and set the Class A bias specifically for the musical situation at hand. These calculations occur instantaneously and continually during the operational mode. The result is that the Master Reference Amplifiers deliver the lowest possible distortion under all conditions while delivering exemplary sound with incredible detail and resolution. Sustained Plateau Bias II technology sets a new standard for Class A operation and elevates the Master Reference Amplifiers to a level of performance and output capability never before attained.

Krell Proprietary Output Devices

Each Master Reference Amplifier features an astounding total of 216 proprietary output devices. These devices deliver unlimited current to any loudspeaker under any demand, and they deliver with accuracy. The Master Reference Amplifiers have the capability of tremendous power output, with no limit to that power.

The output devices, manufactured for Krell by Motorola, are specifically selected for sound reproduction and bear the Krell name along with the Motorola logo. These devices also are responsible for effecting higher gain and therefore lower output impedance. This results in lower distortion and greater loudspeaker control than ever before. Power is delivered to the loudspeakers with ease — without stress to the amplifier. The design of the output devices has a frequency response that is tailored for musical reproduction. Music sounds smoother and more naturally rendered.

Totally Balanced Operation

Balanced circuits ensure optimum signal to noise ratios, signal preservation, and accuracy of delivery under every condition; however, the primary benefit of balanced circuitry is loudspeaker control. The Master Reference Amplifiers finesse the music with totally balanced operation *from input to output,* employing either CAST or XLR inputs. In the output stage of each Master Reference Amplifier, independent circuit paths amplify the positive and negative output signals to exercise absolute control over loudspeaker systems and force the loudspeakers to generate music that is precisely representative of the original signal.

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(TOTALLY BALANCED OPERATION continued)

The Input Stage. The input stage of each amplifier accepts signals in two ways: The CAST inputs accept signals in the current domain, or the XLR input accepts signals in the voltage domain. We recommend using CAST inputs, for the best performance from the amplifiers. When CAST connections are used, the signal received by each amplifier remains in the current domain and is transmitted unchanged through the Krell Current Mode input and output stages, with absolutely no degradation. *Krell CAST and Krell Current Mode are more fully explained on pages 6-7.* When the XLR connection is used, a signal in the voltage domain is delivered to the input stage. Each amplifier converts this signal to the current domain. The signal in the current domain is then sent through the output stage of the amplifier without alteration.

The Output Stage. In the output stage of a conventional amplifier, loudspeaker control is accomplished by driving the positive speaker terminal only. Each Master Reference Amplifier uses two Krell Current Mode circuit paths, one to drive the positive and one to drive the negative terminals of the loudspeakers. These signals work together to drive the loudspeakers, in a precise "push-pull" dialogue that preserves all the characteristics of refined musical reproduction.

The Master Reference Amplifiers set the new standard for ultimate power and performance. Their ability to resolve detail, recreate holographic imaging, convey impact, and preserve tonal balance is unparalleled. The Master Reference Amplifiers represent the culmination of the latest research and development from Krell Industries, Inc., and are the pinnacle of a long line of exceptional audio components from The Leader in Audio Engineering — Krell.

Connections

This section describes Master Reference Amplifier connections and Krell Link, and outlines remote control options.

CAST and Balanced Connections

Each Master Reference Amplifier has a CAST 4-pin connector, a balanced input via an XLR connector, a Krell Link output and input via DIN connectors, and an RC-5 input on the back panel.

Krell recommends using its proprietary Krell CAST system for unparalleled sonic performance for connections between the Master Reference Amplifiers, the KPS 25sc Krell Playback System, and other CAST sources. Krell CAST uses flexible interconnecting cables that can be drawn through tight spaces and concealed.

The Master Reference Amplifiers also offer balanced operation. Single-ended operation is not an option with Master Reference Amplifiers.

The Master Reference Amplifiers allow the connection of two independent preamplifier/source components to the CAST and balanced inputs. For example, you may want to connect two discrete front-end systems: Use the CAST input as the connection to a dedicated two-channel system in which the KPS 25sc Krell Playback System is the CAST source. Use the balanced input as the connection to a home theater system.

Switching Between CAST and Balanced Inputs

If a CAST and balanced source are connected during the initial installation, the Master Reference Amplifiers default to CAST. Use the rear panel input button or the display key on a Krell remote control to switch between inputs. If only one source is connected, the amplifier will automatically select that source. When both inputs are connected, the blue input LEDs illuminate to indicate which input is selected. The selected input LEDs illuminate when the amplifiers are in stand-by and the operational mode.

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Krell Link Connections

Components connected through Krell Link are controlled from one Krell amplifier or preamplifier, designated the control component. All linked components respond to stand-by and operational mode commands from the control component via MIDI cables.

Using Linked Components

When the control component is switched to the operational mode from stand-by, all linked components switch to the operational mode simultaneously. A linked component can be switched individually between the operational mode and stand-by from its front panel. Switching a linked component temporarily breaks the chain of linked components. Returning all components to stand-by or the operational mode manually re-establishes the link.

Remote Control Options

Each Master Reference Amplifier has a remote control sensor, located on the amplifier front panel. The amplifiers are compatible with all Krell remote controls except the handheld KPS 25sc remote control. Remote control options allow you to perform basic amplifier operations and use components connected through Krell Link.

RC-5 Remote Control

Each Master Reference Amplifier has an RC-5 remote input on the back panel. The RC-5 remote input accepts a remote command to switch between the stand-by and operational modes and to switch between CAST and balanced outputs. This input is used, for example, for situations in which the amplifiers are installed outside the listening room.

Amplifier Operation

Krell recommends leaving the Master Reference Amplifiers in stand-by between listening sessions. Turn the amplifiers off, with the back panel power breaker switch, when the system is not being used for an extended period.

The procedures for amplifier operation are as follows:

1. Insert the AC power cord plugs into the dedicated wall outlets.
2. Move the back panel power breaker switch to the up position on each amplifier.
3. Before the amplifier switches to stand-by, there are four click sounds from the relays. The stand-by LED on the back panel illuminates. After approximately 10 seconds, the amplifier is in stand-by.
4. Press the stand-by button on the back panel to switch between stand-by and the operational mode. The blue light behind the front panel illuminates.
5. After approximately 5 seconds, the amplifier switches to the operational mode. The amplifier is now ready to play music.
6. To return to stand-by, press the stand-by button again.

Turning off the Front Panel Blue Light

The blue light behind the front panel of each amplifier illuminates when the amplifier is in the operational mode. The procedure for turning off the light is as follows:

1. Locate the stand-by and input buttons, in the top left corner of the back panel of the amplifier.
2. Push and hold the stand-by button, then push the input button.
3. Release the input button only.
4. Release the stand-by button. The blue light behind the front panel will turn off immediately.

Repeat steps 2-4 to turn the light on again.

This procedure can be performed when the amplifiers are in stand-by or the operational mode.

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IMPORTANT

Always turn off an amplifier before changing input connections, and mute or fully attenuate the preamplifier level when switching sources.

Master Reference Amplifiers have tremendous reserves of power and safely drive loudspeakers to extremely high sound pressure levels. However, use care when setting high playback levels and lower the volume level at any sign of loudspeaker distress.

Krell Link Operation

Krell Link connections are more fully explained on page 12.

1. When all components are linked, move the back panel power switch to the up position on all components. This ensures all components are synchronized when signals from the control component are sent to linked components.
2. The components are now in stand-by.
3. Switch the control component to the operational mode from the control component's front panel or remote control. All linked components switch to the operational mode simultaneously.

System Protection

The Master Reference Amplifiers incorporate a complement of sophisticated protection circuits to safeguard your system. This circuitry constantly evaluates the operation of the Master Reference Amplifiers and provides protection against potentially damaging DC input or output and short circuits. Regulator operation is also continuously monitored to ensure constant voltage to the output stage. These protective systems are designed to prevent damage to the Master Reference Amplifiers or loudspeakers caused by other defective components, faulty wiring, system mishandling, or amplifier failure.

Amplifier Care

Because the Master Reference Amplifiers are capable of enormous power output, it is important to exercise care during system operation.

Avoid any action that can generate large transient signals. Always mute the pre-amplifier output before switching between active sources or cuing an LP.

Do not change inputs to the amplifiers while the amplifiers are on.

Use care when listening at high volume levels. Because of their tremendous reserves of clean power, the Master Reference Amplifiers can drive loudspeakers to much higher sound pressure levels than other amplifiers without clipping. Always lower the volume level at the first sign of loudspeaker distress.

Also exercise great care when handling an amplifier — especially at the back panel. Rings, necklaces, bracelets, and other pieces of metal jewelry can conduct electricity. Consider removing them before touching any part of the back panel.

Warranty

Each Krell Master Reference Amplifier has a limited and transferable warranty of five years for parts and labor on circuitry. Should this product fail to perform at any time during the warranty, Krell will repair it at no cost to the owner, except as set forth in this warranty.

This warranty does not apply to damage caused by acts of God or nature.

The warranty described on this page shall be in lieu of any other warranty, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose. There are no warranties which exceed beyond those described in this document. If this product does not perform as warranted herein, the owner's sole remedy shall be repair. In no event will Krell be liable for incidental or consequential damages arising from purchase, use, or inability to use this product, even if Krell has been advised of the possibility of such damages.

The warranty period begins on the date of retail purchase, as noted on the retail sales slip provided by an authorized Krell dealer or distributor, or on the warranty registration card sent to Krell. In the event adequate proof of purchase date is unavailable, the warranty period will begin on the date the unit was originally shipped from the factory. Krell can determine the original ship date from the serial number.

Transfer of warranty to a second owner occurs automatically. Please contact Krell to have the registration on the warranty changed. When the warranty is transferred, any successive owner assumes the remainder of the original warranty period.

The warranty for Krell products is valid only in the country to which they were originally shipped, through the authorized Krell distributor for that country, and at the factory. There may be restrictions on or changes to Krell's warranty because of regulations within a specific country. Please check with your distributor for a complete understanding of the warranty in your country.

If a unit is serviced by a distributor who did not import the unit, there may be a charge for service, even if the product is within the warranty period.

Freight to the factory is your responsibility. Return freight within the United States (U.S.A.) is included in the warranty. If you have purchased your Krell product outside the U.S.A. and wish to have it serviced at the factory, all freight and associated charges to the factory are your responsibility.

Krell will pay return freight to the U.S.A.-based freight forwarder of your choice. Freight and other charges to ship the unit from the freight forwarder to you are also your responsibility.

Krell is not responsible for any damage incurred in transit. Krell will file claims for damages as necessary for units damaged in transit to the factory. You are responsible for filing claims for shipping damages during the return shipment.

Krell does not supply replacement parts and/or products to the owner of the unit. Replacement parts and/or products will be furnished only to the distributor performing service on this unit on an exchange basis only; any parts and/or products returned to Krell for exchange become the property of Krell.

No expressed or implied warranty is made for any Krell product damaged by accident, abuse, misuse, natural or personal disaster, or unauthorized modification.

Any unauthorized voltage conversion, disassembly, component replacement, perforation of chassis, updates, or modifications performed to the unit will void the warranty.

The operating voltage of this unit is determined by the factory and can only be changed by an authorized Krell distributor or at the factory. The voltage for this product in the U.S.A. cannot be changed until six months from the original purchase date.

In the event that Krell receives a product for warranty service that has been modified in any way without Krell authorization, all warranties on that product will be void. The product will be returned to original factory layout specifications at the owner's expense before it is repaired. All repairs required after the product has been returned to original factory specifications will be charged to the customer, at current parts and labor rates.

All operational features, functions, and specifications and policies are subject to change without notification.

To register your product for warranty benefits, please complete and return the Warranty Registration Card enclosed in the shipping box within 15 days of purchase. Thank you.

KRELL

THE LEADER IN AUDIO ENGINEERING

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