



# KRELL K-300i

**DIGITAL INTEGRATED AMPLIFIER**

**Reviewer** William H. Fisher

**D**an D'Agostino and Mark Levinson are the two amplifier designers who, many years ago, put the world of audio on the path to 'high-resolution' by building amplifiers the like of which no-one had ever seen before.

Both men proved to be better audio engineers than they were businessmen, because Mark Levinson is no longer the owner of the company he founded (even though it still carries his name) and Dan D'Agostino is no longer with the company he founded, which, as you've probably guessed, was Krell.

Krell's fortunes have fluctuated over the years, but a change of ownership has seen a renewed focus on the company's core values, and the release of a renewed product range, of which this new K-300i digital integrated is a leading light.

The design brief for the new K-300i was to bring Krell right up-to-date in terms of the level of connectivity that's required in this modern, digital, streaming world, yet without sacrificing the performance levels for which the company became famous. And, at the risk of pre-empting myself, can I hint to you that it's succeeded?

## **THE EQUIPMENT**

It is extremely significant that this new K-300i integrated has two features that previously have been available only on this US company's top-shelf amplifiers: one (called iBias) adjusts the bias of the output transistors dynamically, to reduce distortion, whilst the other, (called XD) reduces the amplifier's output impedance, which increases its ability to control any loudspeakers that might be used in conjunction with it.

As you can see, the amplifier looks great, fully living up to my expectations for a product bearing the famous name. It's an imposing-looking unit with a clean but brutal appearance. In other words, it's a Krell!

Volume control is controlled by pressing one of either of two buttons on the front panel, or one of two buttons on the remote. This has caused some angst amongst reviewers expecting a traditional rotary volume control, but it proves beyond any doubt that Krell is moving with the times. It's also ensured superbly accurate control over volume adjustment, along with super-low noise and zero pot-induced distortion by ensuring the volume circuit is actually a digitally-controlled switched resistor network.

But the Krell K-300i has other options for volume control, because it has a built-in web server that enables remote control from a mobile phone or from a computer or, indeed, from any device that can be loaded with a web browser such as Chrome, Internet Explorer etc. The only limitation is that whatever device you use must be on the same network as the K-300i.

The Krell K-300i has five analogue inputs (and seven digital inputs), with generic default names of Input 1, Input 2 etc, but you can re-name them to better reflect what's actually connected to them. So if you connected your Rega 8 turntable to one of the inputs, you could label it 'Rega 8' for example. (Although to do this, you'd have to provide your own RIAA phono preamplifier—Krell naturally suggests you use its own K-300p MM/MC phono stage—because the K-300i does not have phono inputs, nor are they available as an option). You can also adjust input sensitivity for each of the analogue inputs, so you won't get differences in volume when switching from one to another. Krell calls this 'Level Trim', and you can adjust levels across a massive 20dB range ( $\pm 10\text{dB}$ ).

However, rather confusingly, there is a second 'Level Trim' mode that is used to adjust the output level of the pre-amp outputs (which are unbalanced) across a 20dB range. This would be useful if you're using some kind of dual-amplifier set-up, and your external amplifier doesn't have its own volume control. Krell's *Owner's Manual* suggests it will also be useful when connecting a powered subwoofer, but I can't see how it would be useful in this application. The pre-amp output can be fixed-voltage (with the voltage set by the Level Trim circuit) or adjustable, so that the voltage is set according to the K-300i's volume control. Because the Krell doesn't have a Rec Out facility, you could use the 'fixed' setting of the pre-amp output to substitute for a Rec Out feature.

I have a complaint here though. The controls are not particularly intuitive to use, with input

changes needing multiple button presses and configuration changes requiring more than a few consultations of the *Owner's Manual*. And, since I am complaining, the process for setting up USB is rather arcane. (But maybe it's just me!)

Thankfully, the supplied metal remote helps make these actions quicker and less tortuous. plus it's also necessary because it's the only way you can easily mute output or adjust channel balance.

#### OPTIONAL DIGITAL MODULE

Two versions of the K-300i are available, a 'standard' integrated amplifier, which retails for \$9,999, and one with a factory-installed digital module, which retails for \$11,999. (You don't have to make up your mind about which one to buy immediately, because if you decide to add the digital module to the K-300i at some later date there is no financial penalty for your delay, because the module costs \$1,999 and installation is free.)

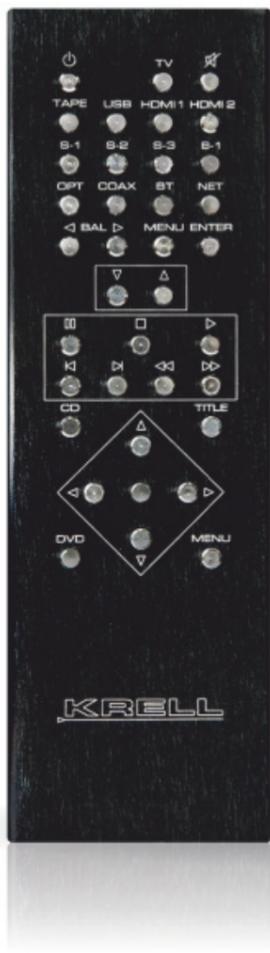
Krell's digital module enables the functionality of the USB-A connector on the front panel (which otherwise doesn't work at all), adds a USB-B connector to the rear panel, along with S/PDIF, TosLink, two HDMI 2.0a HDCP 2.2 inputs and one HDMI output and Bluetooth (AptX) functionality. The digital module also enables streaming functionality (you need to load the free mconnect Control app) enabling access to any streaming services in your area such as Spotify, Tidal, Deezer, Qobus etc. The module is Roon ready, and can play back MQA files. If you want to connect a computer (or NAS) you'll need to be running a DLNA/UPnP compliant music server. Any one should work, but Krell recommends Twonky.



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▽ IT IS EXTREMELY SIGNIFICANT THAT THIS NEW K-300i INTEGRATED HAS TWO FEATURES THAT PREVIOUSLY HAVE BEEN AVAILABLE ONLY ON THIS US COMPANY'S TOP-SHELF AMPLIFIERS: iBIAS AND XD.





Circuitry on the module revolves around an ESS ES9028 device and its minimum phase digital filter.

The USB input will accept up to 24/192kHz PCM files and DSD128 music streams. The coax matches the USB's PCM rating but, as is usual, is not compatible with DSD files. Neither is the optical input, but it will handle 24/96kHz music. The K-300i is also MQA compatible and Roon-ready. I can't think of an alternative integrated amplifier that's as well equipped.

It's interesting that Krell has also included HDMI connectivity in the form of two inputs and an output. It's proof that this once 'audio-only' company now recognises that an increasing number of people use their stereo system to improve their TV sound.

Connecting the amp to a TV's ARC-equipped HDMI socket means that it can strip the audio track from anything the TV is showing. Including such an input shows surprising pragmatism from **such a purist high-end** manufacturer and proves its willingness to accommodate the wide range of sources people use today, irrespective of the audio quality.

Krell doesn't have a dedicated streaming control app for the K-300i but recommends the use of mConnect (iOS and Android). It's free and works well enough but doesn't feel as slick as the dedicated software from the likes of Naim or Linn.

### BUILD QUALITY AND CIRCUITRY

The K-300i feels superbly made. It's solid and gives off an aura of permanence that's hugely appealing. Fit and finish is impressive too, just as it should be for the price. There are two colour options, black and silver. This is a heavy amp, weighing in at almost 24kg, so be careful whenever you have to lift it.

Take the Krell's lid off and it's the sight of that huge 770VA mains transformer and 80,000µF of smoothing capacitance that will grab your attention. That's the kind of power supply arrangement that makes the company's claims

of the power output of the K-300i doubling from 150-watts per channel into 8Ω loads to 300-watts per channel into 4Ω ohm loads totally believable. Those in the know would also be impressed by the neatly designed circuit boards that are fully differential from input stage to output.

In order to understand Krell's iBias circuit, I need to start with some solid-state audio amplifier basics. All audio amplifiers need to use output devices, usually bipolar transistors (they could also use FETS of one flavour or another, but let's keep it simple and stick with bipolar transistors for our example). You can use just a single transistor, which means you've built what's called a 'Class-A' amplifier. Or you can use two transistors, in which you've built what's called a 'Class-B' amplifier. When you use two transistors, you need to use different types of transistor: one type (NPN) for the positive part of the audio signal and another type (PNP) for the negative part of the signal.

Of these two systems, Class-A is the 'ideal' amplifier type, because the same device delivers all the audio signal, so the tonal quality is identical. Class-B amplifiers are 'not ideal' firstly because NPN and PNP transistor types are completely different, so tonal quality suffers, but also because every time the audio signal crosses from NPN to PNP—which it does often... very often—there's a discontinuity at the switchover point, which results in distortion (appropriately called 'crossover' distortion).

Class-A amplifiers are definitely superior to Class-B types, but few companies build them because in order for a Class-A output circuit to work you have to switch the transistor 'on' before it will amplify the audio signal. This is accomplished by applying a bias voltage. The problem is that in order for such a circuit to work, the bias voltage has to be so high that the transistor is effectively operating at its maximum capability all the time, which requires a super-expensive transistor and shed-loads of heat-sinking to get rid of the resulting heat, plus a power supply that's also capable of working at its maximum capacity continuously.

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These requirements mean that Class-A amplifiers are too large, too expensive, too low-powered, and too hot to be particularly practical. Because of the problems inherent in manufacturing Class-A and Class-B amplifiers, almost all available audio amplifiers are what's called 'Class-AB' types. These use two transistors, but (mostly) eliminate crossover distortion by applying enough bias voltage to ensure that both transistors are 'on' all the time, but not enough to tax either the transistors or the power supply. Class-AB amplifiers will work well with only tiny amounts of bias, but they'll work better with more bias, so

different manufacturers choose different bias voltages. But as you increase the bias voltage, you increase the demands on the transistors and the power supply, which means more cost, so most keep the bias voltage fairly low.

But what if, instead of using a fixed bias voltage, you adjusted the bias voltage according to the level of the audio signal: small signal, low bias voltage; large signal, high bias voltage?

Yep, this works, and it's called 'sliding bias' because the voltage 'slides' up and down according to signal level. The problem is that you have to bias the transistors correctly *before* the audio signal arrives, which means monitoring the

input signal. The problem with monitoring the input signal is that while it can be used to predict the voltage the output transistors are required to deliver, it can't predict the output current the transistors are required to deliver.

This is where Krell's circuit differs from any 'sliding bias' system I have previously encountered, because it calculates the bias voltage that needs to be applied by monitoring the output stage of the amplifier, rather than the input stage. Without being privy to any of the technical details this seems like a very sensible *schema* and I can only wonder how the circuit can work since, going on this public description, the output transistor has played its part before Krell gets to measure the bias that it should have applied. My best guess is that this is where the 'intelligent' bit comes in, and that Krell is using some kind of 'learning' algorithm to predict the amount of bias that will be required, so it can be applied before the audio signal arrives at the transistors. If I'm right, this is very, very clever!

#### IN USE AND SOUND QUALITY

When installing the Krell K-300i I didn't use my power conditioner, because Krell specifically states in its manual that '*the K-300i may not operate correctly when a.c. regeneration or voltage conversion devices are utilised*' and I didn't want to undermine the integrity of the review process by using an un-approved device. Presumably this also means that the K-300i might also not operate correctly if you're using a step-up or step-down device to convert 240V to 110V (or *vice versa*), but I suspect it would work just fine, and that this statement may simply to discourage grey market sales.



Krell's circuit differs from any 'sliding bias' system I have previously encountered, because it calculates the bias voltage that needs to be applied by monitoring the output.



## SPECIFICATIONS

### Krell K-300i Digital

**Price:** \$11,999 (inc. Digital Module)

**Power Output (8Ω):** 150-watts per channel

**Power Output (4Ω):** 300-watts per channel

**Output Current:** 13A (peak)

**Frequency Response:** 20Hz–20kHz ±0.11dB

**Frequency Bandwidth:** <10Hz–100kHz –0.57dB

**S/Ratio (Unweighted):** >104dB

**S/Ratio (A-weighted):** >117dB

**Gain:** 25dB

**THD:** <0.015% (1kHz, 150W, 8Ω load)

**Slew Rate:** 46V/μs

**Output Impedance:** <0.035Ω, 20Hz–20kHz

**Damping Factor:** >228, 20Hz–20kHz, (8 Ω)

**Input Impedance:** 16kΩ (Bal); 8kΩ (unbalanced)

**Power Consumption (Standby):** 11-watts

**Power Consumption (Idle):** 46-watts

**Power Consumption (Max):** 900-watts

**Dimensions (WHD):** 438×105×457mm

**Weight:** 23.6kg

**Contact:** Audio Marketing on (02) 9882 3877 or  
www.audiomarketing.com.au

### Feature Set:

#### Inputs:

- 2 pr. balanced via XLR connectors
- 3 pr. single-ended via RCA connectors
- **Digital Inputs (Optional)**
- 1 EIAJ Toslink Optical
- 1 S/PDIF Coax
- 2 HDMI (HDMI 2.0a, HDCP 2.2) + 1 HDMI Output
- 1 USB-A (USB 2.0 host)
- 1 USB-B (USB 2.0 audio device)
- 1 Bluetooth with aptX

#### Outputs:

- 1 pr. preamp outputs via RCA connectors
- 1 pr. speaker outputs via gold-plated binding posts

#### Control Inputs:

- 1 RS-232 input via 9-pin D-subminiature connector
- 1 remote IR detector input via 3-conductor 3.5 mm connector
- 1 12 VDC trigger input via 2-conductor 3.5 mm connector

#### Control Output:

- 1 12 VDC trigger output (60 mA maximum current) via 2-conductor 3.5 mm connector

I started playing the new album 'Stay Around' which is strangely advertised as 'the first posthumous release' from J.J. Cale, which seems to presume he might be releasing a few more 'posthumous' releases. I knew that J.J. Cale was withdrawn and avoided publicity, but this seems to be taking it to extremes. Anyway, the Krell K-300i was an ideal vehicle to deliver his songs, because although it's all laid-back and bluesy/boogie, there's a lot of instrumental sounds to reproduce and a lot of musicianship going on, because it seemed that anyone who was anyone wanted to play with J.J. (most famously Eric Clapton and Mark Knopfler).

The sound of the Krell K-300i was not only totally transparent, but also separated the threads of the music at the same time it integrated them, so every instrument, and every vocal, was in its own acoustic space. For tracks that were obviously never intended for release, the sound quality is unbelievably good, just listen to the drums and bass on *Stay Around*, or the guitar on *Oh My*. In fact, listen to everything on *Oh My*, because it's been recorded 'dry'—probably as a demo—so there's no prettying-up or 'production'. The recording of Cale's voice, for example, on this track is incredible. A real hi-fi show demo track if ever I heard one. This isn't true of all the tracks, by the way: *My Baby Blues* is 'way overproduced and, as a result, a bit muddy.

But just listen to the brush-work and piano sound on *Tell Daddy*, which is a great song, by the way... how did this never make it onto an album while J.J. was still with us? But just as the K-300i was able to reveal the sonic diamonds contained within *Stay Around*, it was also absolutely ruthless in revealing the dross, perhaps notably J.J.'s impossibly badly recorded vocal on *Don't Call Me Joe*.

Further listening with some vintage J.J. Cale, recorded when he was still with us, proved clear evidence of the sonic purity of the Krell K-300i—songs you just can't not own, such as *Magnolia*, *After Midnight*, *Crazy Momma*, *City Girls* and, of course, *Cocaine*, were made tangibly real by the Krell K-300i. Masterful performances by all concerned.

As for power, just listen to the depth-charge bass on Moodyman's *I'll Provide*, from his album 'Sinner'. Turn up the volume at the peril of your speakers, because the beats come from nowhere—there's just no warning of the aural assaults on your ears. But if your speakers can take the power, you'll wonder at the cleanliness of the bass, as well as the absolute silence of the backgrounds. This is one hell of a quiet amplifier! The control the Krell K-300i exerted on bass drivers was also surely a testament to the efficacy of the XD circuitry. If this is XD working its magic, bring it on, I say, because the various speakers I used to prepare this review never sounded better. The Krell K-300i can mix it up across the octaves too: witness *Deeper Shadow*, with the pipes of Sadie Walker no less, on the same album. It's an ear-opener.

The Krell K-300i's ability to articulate female vocal was amply demonstrated listening to Norah Jones' 'Begin Again', though when I say 'album', it's really just a collection of singles that Jones had already released but, since I don't follow her slavishly, I hadn't previously heard it. And I liked what I heard. It's nothing like the inoffensive dinner party jazz she toyed with that turned many audiophiles away (particularly when heard for the millionth time at an audio show). But if you want to hear Jones at her best, buy her 2012 album 'Little Broken Hearts'... you won't regret the investment.

But although the Krell K-300i is a highly transparent performer it can't make a silk purse from a sow's ear, a truth that was brought home when I started evaluating the digital and wireless inputs (the review amplifier having the digital module fitted) and I played some tunes from an Apple iPhone X via Bluetooth.



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The connection is quick and fuss-free, but the results across a range of music from Kate Bush to Olafur Arnalds proved listenable at best. That's not the Krell's fault, though. It's a highly resolving product that's simply showing the input signal for what it is. With Bluetooth, dynamics are limited, as is transparency and resolution. That said, the sound is still entertaining and it does open up your system to playing music that you might never hear in another way.

Sonic normality was restored when I started listening to music sourced from my network. Here I played all sorts of recordings, from a CD spec 16/44.1kHz file of *Undun* by The Roots, right the way through to

Hans Zimmer's *The Dark Knight Rises OST* (24/192kHz) and Stevie Wonder's *Innervisions* (DSD).

With *Undun* I was able to easily follow the group's vocals and revel in the thumping beats and the smooth flowing rhythms. This amplifier resolves an impressive amount of information and organises it with class-leading stability and control. It's rare to come across an integrated amplifier that sounds so composed, irrespective of the complexity of the recording. This aspect is highlighted with the *Dark Knight Rises OST*. Here the Krell's brightly-lighted and strongly etched presentation works a treat. It sounds wonderfully agile and punchy, carrying a big bat while still able to speak softly when the

music demands. The results were equally positive with the other hard-wire digital inputs, proving that the optional digital module is a good one—and great value. Across all these sources, the Krell's detail resolution was even better than I expected, with the convincingly even tonal balance and spacious, uncluttered character remaining unchanged irrespective of which one I used. I find I'm now more aware of instrumental textures and notice more of the dynamic nuances in a recording as a result.

Such is the amplifier's combination of control and muscle that it sounds right at home delivering massive volume levels through every speaker I connected to it, from a pair of ATC SCM50s to a pair of Revel Performa M126Bes, and I was positively shocked by how well the K-300i delivers a soundtrack's huge dynamic swings and by the way it gripped the woofers to produce what is arguably the tautest bass I've heard from any amplifier at this level.

You can also add the Krell's ability to deliver a wide, stable and wonderfully precise soundstage to the long list of positives you need to use to describe its performance. It's easy to pinpoint the position of instruments in the orchestra and their placement remains focused, even at higher volumes. That's quite some achievement.

#### CONCLUSION

Krell released its first integrated, the KAV-300i, back in the mid-90s. That first amp was a fantastic performer and the K-300i reminded me of that... along with the fact that like that amplifier, the K-300i is also built entirely in the USA, comes with a forward-looking feature set, a generous five-year warranty plus, of course, it delivers that famous Krell sound.

Indeed the performance of the Krell K-300i proves that there's no reason to spend more on amplification, while the performance of its digital module proves there's no reason to spend any money at all on an outboard digital solution. So it's not only the lowest-priced amplifier the company currently makes, but also a high-end bargain. 

# A TIMELESS MACHINE SET TO BECOME A CONTEMPORARY CLASSIC.



**Krell K-300i**  
Amplifier of the Year  
\$5000 - \$10000



Paying homage to original KAV-300, K300i is a stunning combination of proven design excellence and contemporary digital capabilities. At its heart, a next generation amplifier circuit features Krell iBias™ technology, brings the sonic benefits of Class A operation (150 Watts/Channel into 8Ω and 300 Watts/Channel into 4Ω) without excessive heat or power consumption.

On board, the ESS Sabre Pro DAC and network streaming audio renderer play files up to 192kHz/24-bit from UPnP music servers or NAS devices. While a new mconnect Control app provides access to popular streaming services and can decode MQA (Master Quality Authenticated) files.

Look closer and you'll find HDMI 2.0 supporting 4K UHD with HDR are available for TV viewing with audiophile grade sound quality.

**Timeless and contemporary have never been so close.**

**KRELL**  
THE LEADER IN AUDIO ENGINEERING

