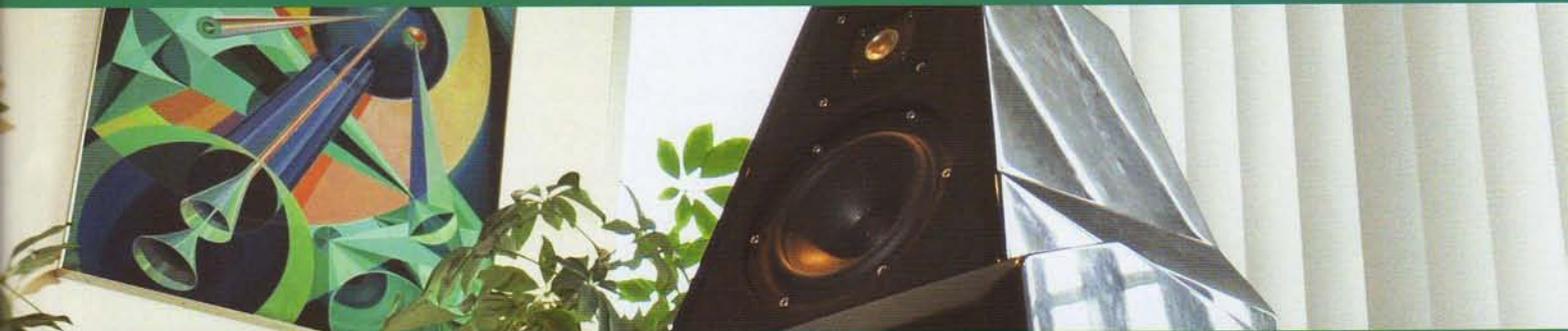


HIFICRITIC



AUDIO REVIEW JOURNAL

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NAIM DAC (+XPS)
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CH..CH..CH..CHANGES

Hi-fi business practice as well technology is evolving

MUSIC & MORE

Krell S-300i Integrated Amplifier

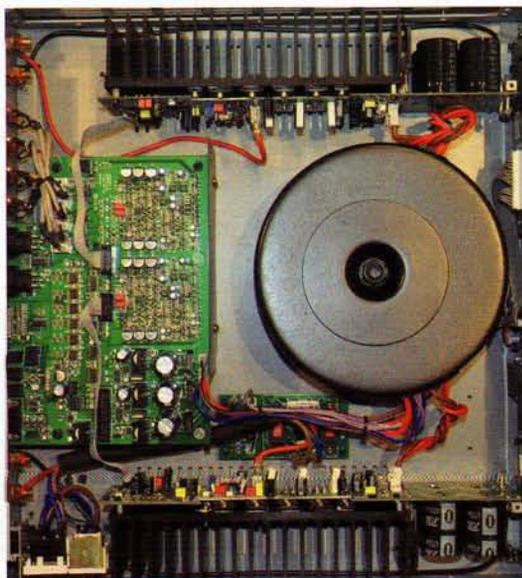
A POCKET BATTLESHIP OF AN INTEGRATED AMPLIFIER BY MARTIN COLLOMS



The very first thing that impressed me about this 'first from China' Krell (origin unambiguously printed on the rear panel), was the sheer mass of the packed unit: 23kg/51lb bodes well for build quality and for the large power rating of the mains transformer. The Editor is wont to comment how often mass, or more specifically density, provides a useful guesstimate of possible loudspeaker performance, particularly when comparing like models in a group test. I have found that this can also be true for audio electronics, except where examples are deliberately built of special lightweight materials.

The central volume rotary encoder has a secondary function as a control and data input for selecting various operating modes, many of which allow the user to customise the inputs, their sensitivity and channel balance offset if required, plus display dim and auto off functions.

Krell's *KID iPod* dock featured an analogue, balanced audio interface to an *iPod's* multi-pin connection. Costing little more than the *KID* dock, the *S-300i* now includes a balanced 'audio pod' connection, via a sufficiently long included cable, rather than a physical dock. Like the *KID*, it allows



iPod album and track selection, play, pause etcetera via a dedicated keypad section on the main Krell remote control. It's helpful to be able to see the *iPod* screen while using these controls.

Krell has provided some revealing data about the £2,400 *S-300i* which hints at the potential available. Good eco-friendliness is promised by the claimed low 20W standby power, despite the toroidal mains transformer's large 750VA rating. However my VI meter contradicts this claim, measuring 42W/68VA on standby and 68W/104VA when 'on' at moderate volume (*ie* that of an average tungsten light bulb), and rather different from the spec. Nevertheless it is still quite low by audiophile product standards.

On the basis that the mains transformer is larger than found in many good sized free-standing power amplifiers, the 2x150W 8ohms, 2x300W 4ohms power output rating looks conservative, and I'd suspect that more like 200W and 400W/ch respectively will actually be available into real loudspeaker loads, making this a very powerful integrated amplifier indeed.

This model's US built predecessor, the *KAV 300i* sold for about £3,000 in 1996, so the cost saving for the new build location has dealt a death blow to nearly 15 years of inflation. While the power output ratings for the old and the new are roughly comparable, the earlier design had four 8,200uF Nichicon reservoir capacitors, a smaller 450VA transformer, and idled at 50W. The new has four 4,700uF reservoirs per channel and of course that much larger toroid. There are double mono secondary supplies and reservoirs with four pairs of high current output transistors per channel. This is not a bridged design.

The surface mount technology gives very short signal paths on the central circuit board. Control of DC offset for signal handling, in particular the fully balanced input, is allocated to a number of high precision Burr Brown *OP177* op-amps. Also embedded is the 151-step analogue volume control, an FET-switched miniaturised surface-mount precision resistor ladder controlled via a microprocessor and a front panel rotary encoder volume knob. While miniaturised, Krell's traditional discrete transistor symmetric array amplifier are present. These symmetric DC coupled very wide band stages are essentially immune from slewing with audio bandwidth signals.

Build and finish is very good, like a standard Krell *EVO* pre-amp. The power switch is on the rear panel next to the IEC mains connection, and the speaker terminal layout is sensible, with easy access 'WBT

MARTIN COLLOMS

style' heavy duty binding posts, for wire, spade and 4mm plug connections. Some evenings a mild mechanical hum came from the casework: this may be the transformer's magnetic field exciting the heavy duty steel panel casework, which is securely locked together by plenty of stainless steel socket-head bolts.

Sound quality

In recent years I hadn't found the outgoing '300i very special musically, with barely above average rhythm and timing and an identifiable solid state quality, a leanness of timbre, some upper mid obscuration, and a sort of 'blankness' to the presentation. Right away I knew that the *S-300i* was a different and better amplifier. From the off there was an open and expressive vitality, a confident reach for dynamic expression, crisply focused definition and confident, assertive control of transient sounds right across the frequency range.

Clearly not laid back, neither did it tip the other way to forwardness and brightness. The stereo depth plane was stable, just a little forward of the speakers, but with fine projection and depth. Focus was particularly good for the class, rivalling some more costly pre-/power combinations including some Krells. Image width was decent, if not 'super wide', but groups of musicians appeared well located and remained locked in position.

While it could not be confused with a valve amplifier, its timbre was substantially neutral, generally well balanced and focused, and natural and tidy in the treble. The bass sounded solid, powerful and deep, but just a hint of nasality was heard through the upper mid, the sound on strings showing a touch more 'rosin' than our assumed perfection.

It could kick hard and play really loud into loads above 3ohms. The big three-way *Eidolons* presented no difficulties whatsoever, and this amplifier's dynamic performance and headroom characteristics were more like those of a significantly more costly and substantial amplifier, punching well beyond its weight. Added to this is an inherently lively and upbeat nature that rates better than much of the competition on rhythm and timing, moving significantly towards the involvement we take for granted from a number of Naim designs. Percussion has a realistic 'snap and crack', where other amps in this class can sound a bit muted and lacking drive. Setting the display to 'auto mute' added another few marks, and this amplifier certainly merits care taken with cable selection, routing and dressing. With its overall precision, clout and clarity, the *S-300i* gains a very creditable 45 marks for overall sound quality.

Out of curiosity I also tried the *iPod* interface,

and the Krell handset successfully operated the *iPod* controls. Sound quality was fairly good (and even better with the main CD player disconnected – some interaction perhaps). Although I fancied that I still preferred even a cheap Panasonic battery CD player to those carefully recorded full res WAV files replayed via my Apple *Classic*, it was certainly useable for mood music and for less critical situations.

Some critics have commented on a slight background hiss from this amplifier. I found that it was at a low level, and did not vary much with the volume setting, and was not significantly audible with my 87dB/W *Eidolon Diamond* speakers at my normal 3.5m listening distance. However, some might hear it faintly if closer in, and also with higher sensitivity speakers say 90dB/W or more. I would leave out sensitive horn designs for this reason but check this out with your dealer.

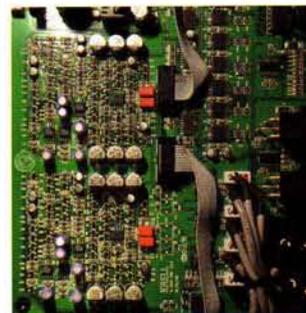
Lab report

The output is generous, and on test still more than claimed, eg 2x190W 8ohms both channels driven and 324W into 4ohms. The very decent 16.5A peak current can drive 3ohm minimum speaker loads to full (4ohm) rated power. Feeding 2ohms, the protection folds back the output to 248W. Maximum per channel short term music duty cycle outputs were 225W 8ohm, 425W 4ohm, and 260W 2ohm. Overdrive of even 6dB remained clean without latching or other misbehaviours, even up to 300W 8ohms at 20kHz. Transformer mechanical hum was low, though there was a trace of hum in the electrical noise floor.

For a typical 10W swept distortion graph, most of the frequency range measured at the inherent noise level of 0.04% or -75dB, while for what it's worth the intrinsic distortion is substantially less (see graphs). For example the two tone CCIF 19/20kHz intermodulation scored -83dB at 1W power and -88dB at 150W. The intrinsic frequency response is wide, barely -0.2dB at 10Hz and 20kHz, while the half power high frequency -3dB point is up at 110kHz. Output impedance averaged a low 0.1 ohms, a little less in the midband, while DC offset was also low.

At volume setting '98' rel 1W, the signal-to-noise ratios were certainly poorer than average with 53dBA, 44dB CCIR (1kHz) and 48 dB unweighted, though supply hum levels were low. I cranked up the input level and with a more normal setting of 49 got 70dBA, 70dB unweighted, and 60dB CCIR which is satisfactory.

Input overload occurs at 5V, +20dB IHF, so do not apply those few high output sources (some CD players, for example). Input impedance is a very



"From the off there was an open and expressive vitality, a confident reach for dynamic expression, crisply focused definition and confident, assertive control of transient sounds right across the frequency range"



source friendly 110kohm, with 130pF of shunt capacitance. Channel balance at higher settings was accurate within 0.047dB at 20kHz, and generally about 0.08dB overall. The volume control has occasional missing codes where a 'click' does not result in a volume change, and where the resolution varies with level. At high settings you get 0.5dB steps; in the '30s' the steps are 0.8dB, with larger steps at very low volumes. This is not untypical of these ladder type controls.

Channel separation was an average and more than satisfactory 67dB at 1kHz and 47dB at 20kHz. Output impedance was a very low and consistent 0.13ohms over the frequency range. Output DC offset was also low, with about 10mV of c1Hz low frequency servo or related noise.

One minor defect concerned the screws holding the rear power switch bracket which were loosening on this well used example. Lock washers might be helpful on this fitting.

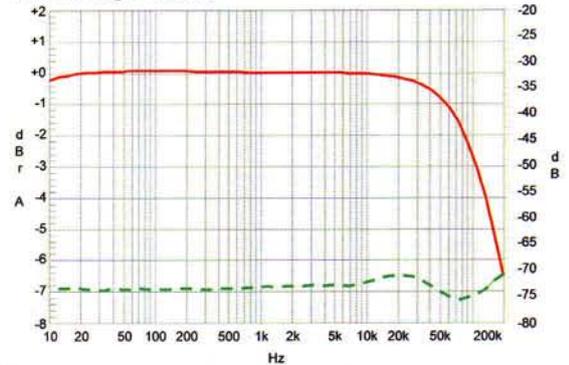
Conclusions

Quality has not been compromised here by Chinese build, and the cost advantage has largely been passed

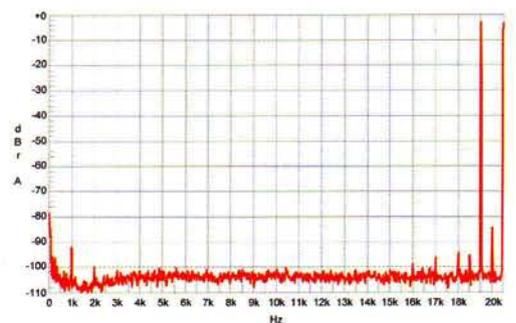
on to the customer, providing greater value for money. Taking everything into account: huge power, good load drive, technical accuracy, an intelligent iPod control interface, confidence inspiring build and finish, the channel balance and source volume offset facility, plus the precision volume control, it is well on the way to recommendation. I consider it can operate comfortably as part of complete hi-fi systems costing up to £15,000.

Add in class leading sound quality (for power and price), with a focused, muscular delivery, good clarity and image depth plus tonal neutrality, good dynamics, above average rhythm and timing, plus a stunning dynamic range, and this is a thoroughly recommendable, all purpose design. Even the handset is top quality.

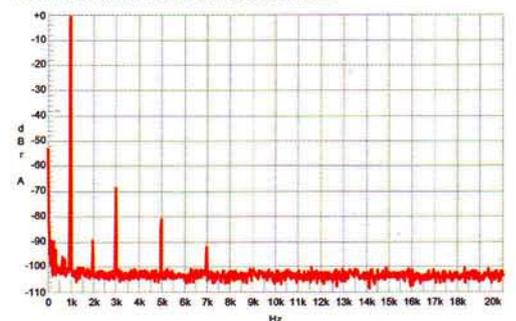
Krell S300i Frequency Response; 10W 8ohm, and distortion (green) RHS



Krell S300i 10W CCIF distortion spectrum 8ohm load, an excellent result



Krell S300i 1W 1kHz distortion spectrum 8ohm load, low order 'odd' harmonics dominant



INTEGRATED AMPLIFIER TEST RESULTS				
Make	Krell			
Date	22/10/09			
Model	S-300i			
Ser. No.	231080800079			
POWER OUTPUT	20Hz	1kHz	20kHz	
Continuous 8 ohm 2 channel	190 W	190 W	188 W	
Continuous 4 ohm 1 channel	320 W	324 W	318 W	
Pulsed 2 ohm 1 channel	248 W			
Output impedance (ohms)	0.15 ohms	0.13 ohms	0.14 ohms	
Peak Current	16.5 A			
Distortion, THD inc. noise (1W)	> -88 dB	-92 dB	-82p dB	
Distortion, THD inc. noise (rated power)	-76 dB			
Channel separation	70 dB	67 dB	47 dB	
Intermodulation Distortion 19.5kHz/20.5kHz 1:1 rated power, 8 ohms	-88 dB			
Intermodulation Distortion 19.5kHz/20.5kHz 1:1 1W, 8 ohms	-83 dB			
Signal to noise ratio (ref. 1W output)	CCIR Weighted	Unweighted	A-weighted	
IHF. 0.5V Aux	65 dB	70 dB	74 dB	
Disc mm	n/a			
Disc mc	n/a			
Channel Balance over volume range				
Rch is reference at 0db			0.08 dB	
at -20db			N/A dB	
at -40dB			0.05 dB	
at -60dB			0.03 dB	
Frequency Response: +0,- 0.2dB 10Hz to 20kHz, -3dB at 110kHz				
Absolute Phase	correct			
Input Data	Socket	Sensitivity	Loading	
Aux input balanced	-	- mV	- ohms	- nF
Aux input single ended (full power)				
Phono or DIN	820 mV	110k ohms	130 pF	
Disc mm Phono or DIN	- mV	- ohms	nF	
Disc mc Phono	- uV	ohms	nF	
DC offset	Left 10 mV	Right 10 mV (VLF servo noise) (1-2.Hz)		
Size W x H x D (weight 19.5kg)	438 mm	102 mm	445 mm	
Price	£2,400			
Contact	Absolute Sounds Tel: 0208 971 3909 www.absolutesounds.com www.krellonline.com			