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Audio Research REF 150 SE

Audio Research revives its tradition of upgrading existing models, this time changing to KT150 valves in its Reference range. KK listens to the REF 150 SE and is amazed
 Review: **Ken Kessler** Lab: **Paul Miller**

When I met Audio Research's new president, after the retirement of my old friend and the company's most devoted champion Terry Dorn, I was instantly reassured. Mike Tsecouras oozed such enthusiasm that I thought I was being introduced to ARC's most loyal customer. Without saying a word, his manner implied that the spirit of the brand would be respected, but that there would be surprises in store.

While the G Series [*HFN* Jan '15] must surely have been under way before Mike arrived, it's safe to say that the new SE versions of the Reference models have appeared under his aegis, with the design team headed by 20-year ARC veteran, Warren Gehl. Three models – the stereo REF 75 [*HFN* Nov '12] and REF 150 [*HFN* Feb '12], and monoblock REF 250 are subject to this change – the revised middle model, the £13k REF 150 SE, being tested here. And its *raison d'être* is the KT150 valve.

THE GO-TO TUBE

This new valve is already well-established as the go-to tube for most progressive amp manufacturers looking to design rugged, high output models. Audio Research is no exception and the KT150 now appears throughout its catalogue. However, if you look at a '150 SE, the only external indication of its presence within is the 'SE' badge on the top and rear panels.

The KT150 power output valve, as found here, is the latest Tung-Sol branded design from New Sensor. When you consider that Tung-Sol was the inventor of the 6550 exactly 60 years ago, a tube created specifically for the audio market, the provenance is impeccable.

Manufactured in Russia, the KT150 is effectively the 21st century default in place of the 6550. It has taken over in a remarkably short time from another new

RIGHT: In addition to the huge PSU and output coupling transformers, this top shot clearly shows the four matched-pair KT150 pentodes and pairs of 6H30P double-triode driver tubes

valve, which I delight in, the KT120, which ARC adopted in 2010. As ARC explains, 'The KT120 was a new design, and offered better current delivery and sonics.' Until the KT150 arrived, it was the basis for all current Audio Research amplifier designs.

Only released in the second half of 2013, the KT150 is still 'new', but has been embraced by manufacturers because it delivers higher plate dissipation and current capability, greater power output and – it is optimistically surmised – 'a longer lifespan than previously available power output tubes'.

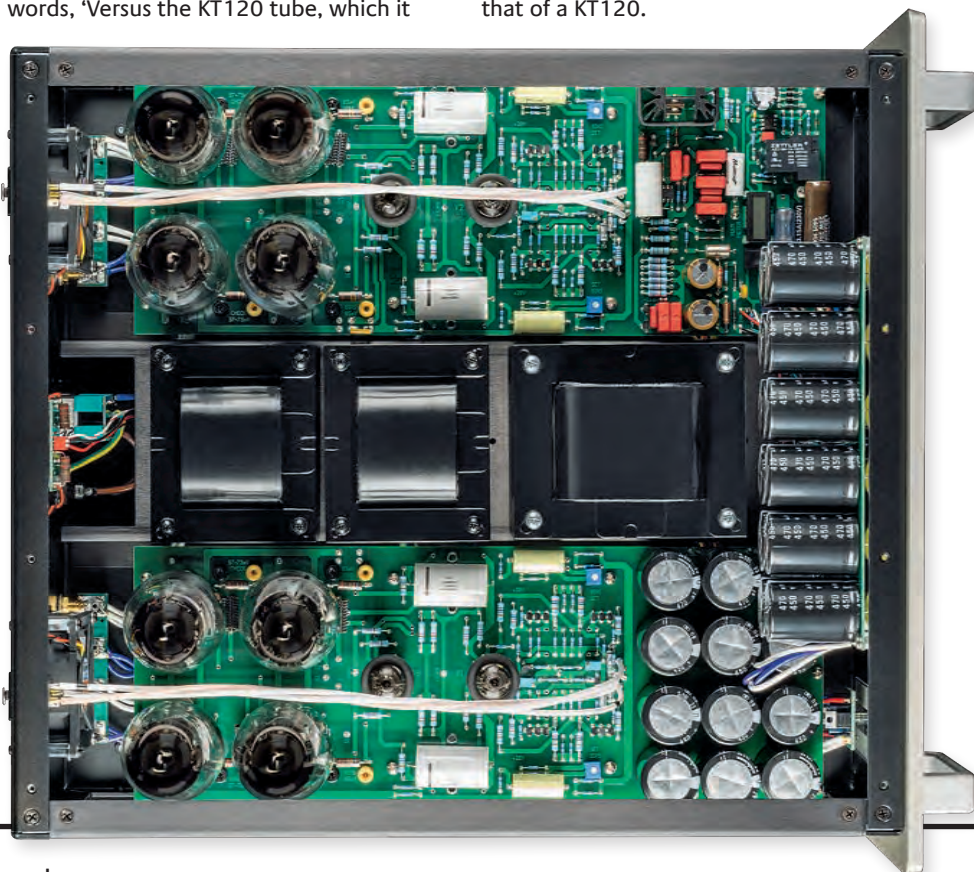
Icon Audio launched the first KT150-equipped amps some two years ago [the MB90 MkII – see *HFN* Mar '14] and the power-hungry high-end tube community hasn't really looked back. ARC began testing for both sound and reliability in late 2013 and were impressed enough to use it as their new power tube. In Warren's words, 'Versus the KT120 tube, which it

most closely resembles sonically, the KT150 imparts a greater sense of foundation, solidity and authority from the midrange on down.

'There is a sense of ease and headroom handling of the music that brings out very low-level dynamic nuances as well as newfound intensity on high level climaxes which build more dramatically.' To my mind, Warren has nailed the sound of the KT150, based on the evidence of what I heard with the REF 150 SE.

BALANCED-ONLY DESIGN

What he doesn't say is that it delivers what may be the *widest* soundstage you'll ever hear from a single-chassis stereo amp. There seems to be power in abundance, too, even when driving Wilson Alexias [*HFN* Mar '13] – beyond what one expects of an amp rated at 150W per channel. The only downside is cost: a KT150's price is double that of a KT120.





The REF150SE looks almost exactly like the non-SE predecessor, with the back containing two fan apertures, speaker terminals for 4, 8 and 16 ohm loads, 12V trigger inputs for switch-on and – because the amp is fully-balanced throughout – balanced-only inputs using XLRs. (At this level, balanced via XLR is now the norm.) Mains is connected with a 20A IEC plug with three horizontal pins.

Aesthetically, there's a minor update in colour schemes, with silver units having silver handles and silver top covers, and black units with black handles and a black cover. ARC will mix the colours to match older models. Whatever details may have changed, the look oozes unmistakable, classic ARC-ness.

Beyond the KT150s, ARC's latest recipe claims doubled PSU energy storage to some 1040 joules [see PM's Lab Report,

p43] and all-new interstage coupling capacitors, a trickle-down from the much admired Anniversary Edition preamplifier, to 'effortlessly link input stage to output stage, which is powered by two matched

quads of KT150 output tubes driven by 6H30 twin triodes'.

The REF 150 SE also uses multistage solid-state regulation, while the output stage configuration is a combination of

ultralinear and Audio Research's patented 'partially cathode-coupled' topology.

STAGGERING REALISM

I used the REF 5 SE preamp with Transparent cable, and Wilson Alexias with Crystal. Sources included the new Musical Fidelity Nu-Vista CD [p44] and Marantz CD-12/DA-12 CD players, while analogue was handled by an SME 30/12 [HFN Mar

'A wee voice was telling me that I was renewing my vows with ARC'

ABOVE: Unlike the REF 75, the REF 150 SE is meter-less, a simple metal slab with on/off rocker and green LED. The build is exceptional, and you will be grateful for the handles

'09] with 12in Series V arm, Clearaudio Goldfinger MC [HFN Jan '15] and EAT E-Glo phono amplifier.

Even without finding my copy of Marlene Dietrich's hits, I couldn't help but hear 'Falling In Love Again' – despite the fact that my turntable was playing Mose Allison's *Takes To The Hills* [Pure Pleasure BA17031]. Thus, while the speakers issued forth some of the most sly jazz singing ever heard, with a richness and warmth that could only come from valves, a wee voice in the back of my head was telling me I was renewing my vows with Audio Research.

Not that I had ever forsaken the brand. It's just that the Wilson Alexias want a bit more power than can be mustered by my REF 75 (an amp I want to hear in SE form before I trade it in toward a REF 150 SE).

Trust me: the immediate impression you will get, once the '150 SE has reached operating temperature, is of staggering realism. Three areas of gain are utterly blatant: bass quality and extension, stage width and midband naturalness.

Mose was right *there* in the room. His 'Please Don't Talk About Me When I'm Gone' is a jaunty, swinging affair, with subtle brushwork from the drummer, wondrously clanky piano and a close-miked voice that lets you hear his breathing. Alas, it's over in 1m 27s sec, but wow! It was enough to make this listener play the track three more times. Realising this was cruel to the LP, I dug out *The* ➔

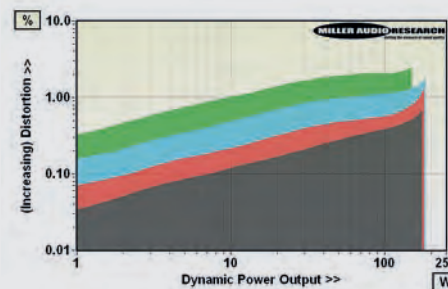
UPGRADES – AN ARC TRADITION!

When ARC's all-new 'Galileo' GS150 [HFN Jan '15] was the first to feature the big KT150 valve, the company was immediately inundated with queries asking whether this output tube would be incorporated into its Reference models. As has been the case with Audio Research since 1970, there is now a retrofit for owners of Reference 75, 150, and 250 amplifiers, but the upgrade is more than just a tube swap. ARC decided 'to include substantial performance upgrades in the Reference amplifiers to coincide with the changeover to the KT150'. In addition to moving from KT120 to KT150, SE versions feature active and passive parts changes for 'dramatic sonic improvements'. While online reports suggest tube swaps are OK, this will not convert the 75, 150 or 250 to full SE status. For £2500 for the REF 75, £4500 for the REF 150 and £4500 (each) for the REF 250 monoblocks, legacy units can be fully upgraded to include *all* the SE gains.

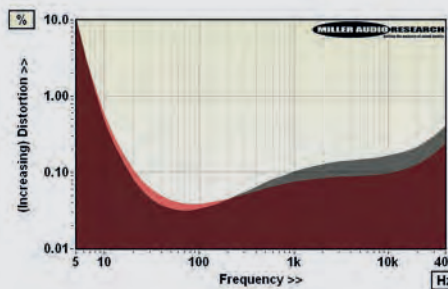
AUDIO RESEARCH REF 150 SE

Ken deals with ARC's description of the updates to its REF 150 amplifier in his review but the £13k-question is – new KT150 tubes notwithstanding – ‘what are the measurable differences in performance?’ Referring back to my lab data for the original REF 150 [*HFN* Feb '12] reveals very little difference in power output or speaker load tolerance between the two models as both offer ~165W into 8/4ohm loads through their 8/4ohm taps and 176W, 175W, 180W and 150W under dynamic conditions into 8, 4, 2 and 1ohm [see Graph 1, below]. Distortion follows the same trends versus output and frequency but is very slightly higher at low levels in the new 150 SE (0.038–0.123% versus 0.010–0.090% from 1-10W/8ohm), although this may well be within production tolerances. Versus frequency, the REF 150 SE shows the same mild increase from 0.07% (1kHz) to 0.22% (20kHz) at 10W while the substantial output transformers ensure low distortion – 0.26% – is also maintained down to 20Hz bass frequencies [see Graph 2].

As before, the REF 150 SE shows a slightly ‘warm’ character with an enhanced (+0.1dB) bass and shelved (-0.2dB) presence region. Its high treble response remains more obviously influenced by loading as its output impedance rises from 0.63ohm at 20Hz to 0.74ohm at 1kHz to 1.08ohm at 20kHz, leading to a 20kHz roll-off of -0.13dB into 8ohm (via 8ohm tap) and -0.9dB/-1.75dB into 4/2ohm (via 4ohm tap). Noise is now slightly lower, its 94dB A-wtd S/N ratio (re. 0dBW) besting many solid-state models. Readers are invited to view a comprehensive QC Suite test report for the Audio Research Reference 150 SE tube amplifier by navigating to www.hifinews.com and clicking on the red ‘download’ button. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads via 8/4ohm taps



ABOVE: THD vs. ext. frequency from 5Hz-40kHz at 10W/8ohm (black, left channel; red, right)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	165W / 162W
Dynamic power (<2% THD, 8/4/2/1ohm)	176W / 175W / 180W / 150W
Output impedance (20Hz–20kHz)	0.63–1.08ohm (8ohm tap)
Frequency response (20Hz–100kHz)	+0.1dB to -1.72dB
Input sensitivity (for 0dBW/150W)	171mV / 2135mV (balanced)
A-wtd S/N ratio (re. 0dBW/150W)	93.6dB / 115.4dB
Distortion (20Hz–20kHz, 10W/8ohm)	0.028–0.25%
Power consumption (Idle/Rated o/p)	450W/760W
Dimensions (WHD) / Weight	483x222x495mm / 34kg



ABOVE: Balanced XLR inputs are joined by 4, 8 and 16ohm speaker connections that suit both spades and 4mm plugs. Near-silent fans keep the interior cool

Complete Recordings 1957-1962 [Enlightenment EN5CD9036] to listen to it again and again.

What most impressed as much, though, was the surprise imparted by the lower registers on a recording that I could have sworn was mastered for 7in singles and AM radio – in other words, thin-sounding. Shame on me: my recently-acquired copy of Dino, Desi & Billy's *Our Time's Coming* [Reprise RS-6194] features audiophile deity Don Randi, guitar genius James Burton, super-drummer Hal Blaine and other members of the Wrecking Crew; production was by Lee Hazlewood with Bones Howe among the engineers.

LIKE A TIME MACHINE

Where to start? Every instrument had true-to-life presence, the attack of the percussion perfectly crisp, but with that airy decay which separates the best analogue playback from even the best of digital. Comparing it to the CD, it still sounded fabulous, but such is the resolution and transparency of the REF 150 SE that it operates like a forensic tool.

So vivid and revealing are its capabilities that one might be forgiven for thinking that it's some solid-state powerhouse engineered for vanishingly low noise levels. This baby *breathes* music.

Back on my Willy DeVille kick I was bowled over by the crispness of 'Beating Like A Tom-Tom' on *Collected 1976-2009* [Universal 535 759-8], the beat of the percussion timed perfectly with each key tap of the piano. The separation of the instruments was so precise, so clear, that the only word one can apply to the relationship is 'complementary'.

There is a wholeness to the sound of the REF 150 SE which threw me

back a few decades. Every once in a while, one enjoys a *déjà vu* so unmistakably accurate and intense that it makes long-forgotten events seem like yesterday.

This amplifier, with its feature-less front panel, boxy form and functional demeanour, became a time machine, recalling the chilling sensations of my early exposure to classics like the Audio Research D70 power amp [*HFN* Feb '84 & Mar '15], the original full-range Apogee and Infinity IRS loudspeakers.

Sometimes, you just *feel* when a piece is right. I experienced that with the REF 75 so forcefully that I bought it. All it took for the REF 150 SE to do this was 20 seconds' worth of the extended version of 'Assassin Of Love': among DeVille's finest moments and a recording to savour, a performance in which to wallow.

So comprehensive was the amplifier's authority that my system was completely transformed, revealing aspects of the Alexias' delivery I had never taxed. It is no coincidence that the first track on the disc is 'Miracle'. ☺

HI-FI NEWS VERDICT

I've loved the REF 75 since first hearing it but the REF 150 SE is a level beyond. The first REF 150 blew me away, yet the SE shows gains, especially in the bass, midband and stage width, one could not have anticipated. How much is due to KT150s and how much to new parts I cannot say. Regardless, the upgrade borders on the supernatural. With both small and large 'R's, this is my new reference.

Sound Quality: 88%

