

# Audio Research REF 6SE

The REF 6 replaced Audio Research's long-serving REF 5 tube preamp back in 2015 but five years of running production updates have now culminated in this 'SE' refresh  
 Review: **David Price** Lab: **Paul Miller**

The Audio Research Corporation is a company with provenance, a truth that's instantly apparent when first setting eyes upon its new £16,998 REF 6SE line-stage preamplifier. Indeed, its history shouts out at you, from the iconic styling with shades of its 1970s SP-series preamps, to the industrial-quality construction which underlines that it's built to last. Rather like its manufacturer, in fact.

This is the latest in a long line of premium-priced tube preamps [see PM's boxout, p61] and one of several products, including the REF 750SE power amp and REF CD9SE CD player/DAC [HFN Aug '19], to benefit from ARC's 'SE upgrade package' as part of the company's 50th anniversary celebrations. Importantly, current REF 6 owners aren't forgotten about, because their preamps can be upgraded to REF 6SE status for the princely sum of £4000.

## UP CLOSE

The REF 6SE is from the less-is-more school of preamplifiers, being a fully balanced, single-stage Class A design with zero overall feedback claimed, and no phono stage or internal DAC with USB connectivity. Oh, and you can whistle for a built-in streamer. Indeed, its bluff simplicity – superficially at least – is a big part of its appeal.

The chunky fascia sports two large knobs to handle source selection and volume. Between these is a row of decent sized buttons below, offering switching for power, mono, menu, enter, phase invert and mute. Above, there's a large alphanumeric display showing the input selected, and volume on a scale of 0 to 103 – the latter in large, pixelated numbers. The crudeness of the display may well look like a raised finger to manufacturers offering fancy fine-pitch OLED panels, but its physical size reminds

**RIGHT:** Under a clear, perforated top plate the tube audio stage employs six 6H30 triodes [three per channel – top] with another 6H30 and larger 6550WE beam tetrode [bottom] for high voltage PSU regulation [far left]. The low voltage power supply is entirely separate [far right]

us that ARC's customers may enjoy large listening rooms that require the display to be seen from a distance.

It's a sight for sore eyes, inside. The translucent top cover means you can see how precisely this preamp is laid out with every inch of 'real estate' occupied [see pic, below]. To the right of the power supply's array of smoothing capacitors, the vacuum tubes take pride of place, with a 6H30 triode and 6550WE tetrode sitting front and centre. The other six 6H30s, the beating heart of the audio circuit, reside further back towards the rear of the board, which is neatly laid out with full-sized components and tidy wiring.

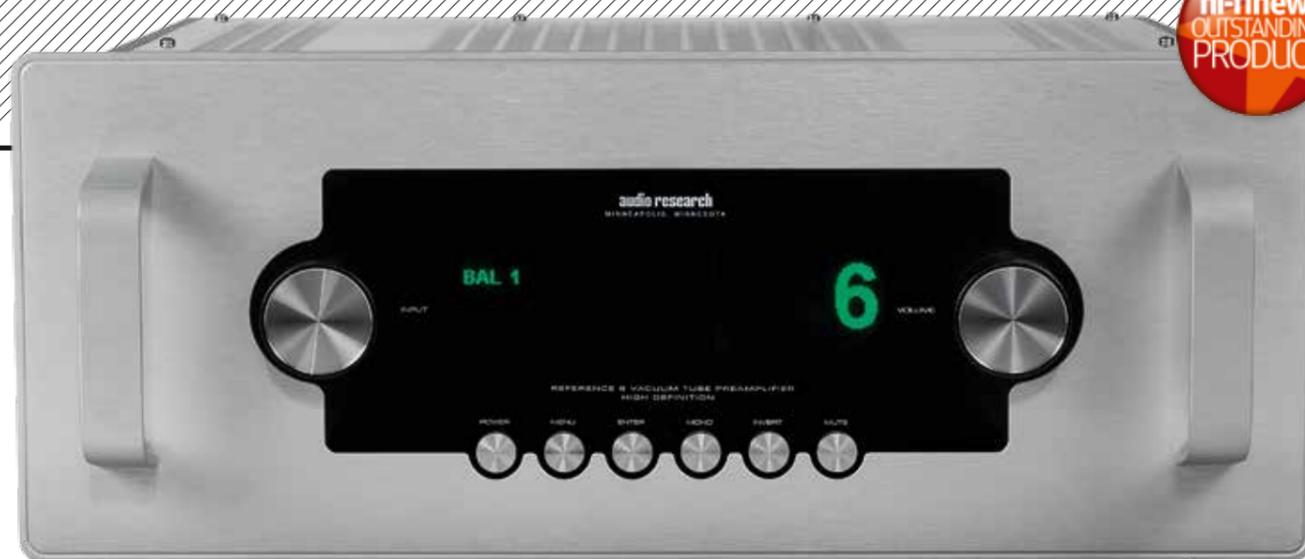
It's likely that your dealer will fit the tubes; they've already been burned in, tested and electrically matched but the unit isn't transported with them in situ, so the top needs to come off. The company

claims a life of approximately 4000 hours for all but the 6550WE, which is half that. Round the back of the preamp [see p63] are eight pairs of input connectors; four on balanced XLRs and four single-ended on RCAs. Outputs include two pairs of XLRs and RCAs, plus a fixed Record Out.

## MODEL MODS

The settings menu offers a choice of auto shutdown time, processor mode (pass through), tube hours display, display brightness, volume reset (input level setting) and input naming. Some of these features – like display brightness – can be controlled directly via the remote.

ARC says the modifications to this new model stem from the development of its Reference 160-series amplifiers [HFN Aug '18 & Feb '20], and the latest Reference 750SEL. The company is coy



about the exact details of the tweaks involved, but MD David Gordon says that 17 capacitor changes and 12 revisions to the internal wiring have been incorporated – the superior geometries, precision and dielectrics all chosen to 'reduce signal smearing'. While ARC is evidently keeping the full details of these tweaks very close to its corporate chest, Gordon did venture 'there are no measurable differences between the 6 and the 6SE on the bench, but the sonic differences are startling'. However, that, as editor PM was keen to point out, rather depends on what you are measuring.

Sure enough, the basics – including overall gain, S/N ratio, headroom, frequency response – are broadly unchanged, but the trend of distortion versus frequency is not. While both

channels are well within ARC's conservative specification, PM measured a higher THD on the right versus the left channel in this 6SE chassis [see Lab Report, p63].

He was tempted to put this down to errant tube matching until we spotted exactly the same results in partner

magazine *Stereophile's* report on a different sample of the REF 6SE, tested by John Atkinson [see [www.stereophile.com/content/audio-research-reference-6se-line-preamplifier-measurements](http://www.stereophile.com/content/audio-research-reference-6se-line-preamplifier-measurements)]. So this is more likely a design/tweak issue, rather than poor tube matching.

*'It's a gripping rendition of this rap/rock crossover classic'*



## QUIET LIFE

This is one very subtle-sounding tube preamp. Auditioned between a dCS Vivaldi One disc player/DAC [HFN Feb '18],

**ABOVE:** Familiar aesthetics and handles – the REF 6SE has rotary controls for input select and volume, placed either side of a bold fluorescent display, with six function buttons below

Constellation Inspiration Mono power amps [HFN Oct '19] and B&W 800 D3 loudspeakers [HFN Oct '16], it proved highly self-effacing. Give it a late '70s pop/rock track such as 'Kiss On My List' by Daryl Hall and John Oates [Looking Back; BMG PD 90388], and one can clearly hear its bone-dry production. There's little tonal warmth, and percussion is taut and well damped. Yet there's a subtle gentility to the sound, a slight sweetening of this bitter pill of a recording that's wholly welcome.

The track's soaring vocals as the singers rip into the chorus can sometimes grate on forensically-inclined high-end equipment, yet it was more palatable here. The result was a sound that took the spotlight off the production's imperfections, and let the listener cast their gaze upon the music.

However, this almost imperceptible gentrification doesn't impact on its sense of speed. The opening drum machine ride cymbal on Run DMC's 'Walk This Way' [It's Like This; Polydor POCP-1088] was lightning-fast, slicing through the air in PM's listening room like a knife. The bass drum was tight, lithe and propulsive as the beatbox set up a fat groove onto which that classic Aerosmith guitar riff sample was cut-and-pasted. The REF 6SE caught the edge and grit of this, to give a gripping rendition of this rap/rock crossover classic.

## MOVE CLOSER

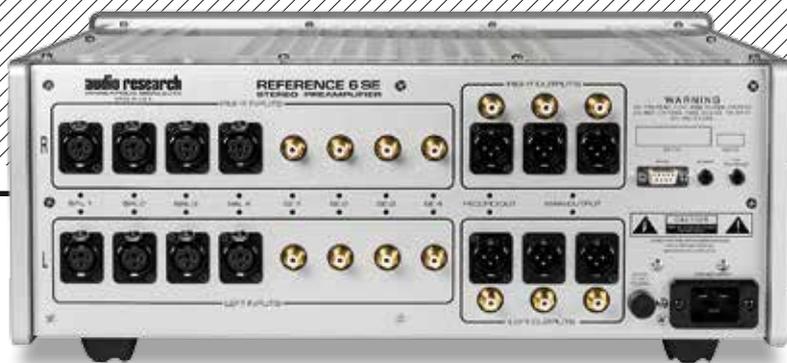
Despite taking the focus off the middling quality of this recording, the REF 6SE is not for obfuscation. More typically it's very revealing of subtle musical detail so it's not necessarily the right choice for enthusiasts looking to 'dial in' some tube preamp softness. The presentation is unforced but highly insightful, easy on the ear while still dripping with filigree detail. By this I don't

## THE GENERATION GAME

Careful evolution best describes the path of ARC's single-chassis Reference preamps, which started with the REF 1 in 1995, notable for its resemblance to 'classic' ARC preamps with its row of knobs above toggles, between handles. Its gain was all-tube, with eight inputs, but with full microprocessor control of volume, balance, record and input selection. It also featured fully regulated power supplies, dedicated analogue and logic transformers and audiophile-grade components throughout. The REF 2 from 1998 looked the same and allowed '1s to be upgraded to '2s. A unity gain stage was added, as was tube regulation. The REF 3 of 2004 was a full re-design, now featuring a fluorescent display and menu that replaced many controls.

With the REF 5 of 2009 – the blueprint of today's REF 6SE – the circuit design was revised again, now fully balanced and operating in pure Class-A triode mode, but the basic look remained the same. Its valve complement comprised four 6H30s in the audio stage, with a 6550 and a 6H30 in the power supply. For the REF 6, ARC introduced an additional 6H30 stage per side, maintaining the same overall gain and low noise but significantly reducing distortion [see Lab Report, p63]. The REF 5 and 6 also ushered in the latest volume circuit – offering a useful 66dB range over 102 steps (from 0-103, with '0' putting the preamp into mute). The volume increments average out at  $\pm 0.3$ dB over the top 60dB of the REF 6SE's dynamic range (103 down to 43),  $\pm 0.9$ dB over the following 30dB (43 to 13) and  $\pm 1.5$ dB right down to '1' on the volume scale. PM

## AUDIO RESEARCH REF 6SE



**ABOVE:** A full eight separate line inputs are offered (four balanced on XLRs and four single-ended on RCAs) with duplicate XLR/RCA record outputs and two sets of XLR/RCA preamp outputs. The latter are variable or fixed in 'processor' mode

mean it fetishises small production effects in a recording – it reveals these very well too, by the way – but rather it tells you all about the timbral qualities of the instruments and vocals that it's reproducing. The result is a really authentic and tangible sound, and one that's impossible not to like.

### PEEL SESSIONS

For example, Electronic's 'Getting Away With It' [*Electronic*; Warner Bros WPCP-4348] was quite a surprise. I love the tune but had always thought it be a dreadful, compressed recording – one likely to have been mastered on DAT, given its mid '80s vintage. The REF 6SE effortlessly peeled away the track's many layers, letting me get right to the centre of the mix.

Indeed I was surprised by the ease with which it all unravelled, this preamplifier resolving Bernard Sumner's vocals with great skill. I've never been a wholehearted fan of his voice, but suddenly there was a tenderness and vulnerability to his performance that had been airbrushed away by lesser preamps.

I also found myself being more impressed by the B&W 800 D3 speakers than I'd expected. I often find these slightly on the clinical side of accurate, yet with this preamp, and system, they seemed to open up and reveal a more human side. So the recording took a climb in my estimation, for while it'll never be a great audiophile reference,



**LEFT:** Partnering remote caters for input selection, mono, mute, volume, balance, phase invert, and access to limited menu functions

neither was it as fizzy, crowded or compressed as I had once imagined.

The REF 6SE doesn't do the 'magic wide stereo' thing – some tube preamps seem to have a subjective 'scale expander' that pushes the recorded acoustic implausibly far beyond the speakers. Instead, the REF 6SE's projection of the musical soundstage seems scrupulously accurate, building an immersive soundfield with great breadth and depth where appropriate, but never when not.

For example, The Style Council's lilting track 'Long Hot Summer' [*Collection*; POCP-1606] was vast in size – with percussion (maracas, sampled handclaps and snares) far left and right, while Paul Weller's vocals were steadfastly locked between the two speakers and recessed back slightly. This gave a panoramic vista to this early '80s recording, adding a grand sense scale to the proceedings.

Yet cue up The Byrds' cover of Bob Dylan's 'My Back Pages' [*The Byrds*; Columbia CK 46773] from the late '60s, and this preamp reels in the soundstage, tightening its focus and delivering a recorded acoustic that's far smaller in scale – just as it should be. Major or minor, the result is never less than compelling. ☺

### HI-FI NEWS VERDICT

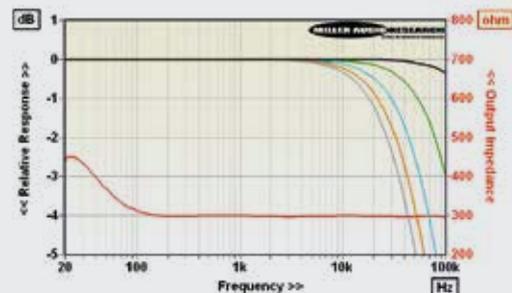
The essence of this ARC REF 6SE preamp is its ability to neither add nor subtract anything of significance – and audibly what little it does bring is for the good, making less perfect recordings more enjoyable. The result is a preamplifier that reminds us of the importance of the breed; a great one such as this finishes off the sound, allowing a superb system to sing in a carefree and untrammelled way.

Sound Quality: 90%

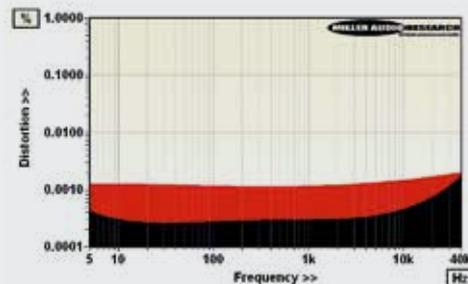


Why a tube preamp? The answer lies in one word – 'headroom'. The balanced outputs are capable of delivering over 60Vrms from a 300ohm source impedance (increasing to 450ohm/20Hz) while the input overload is in excess of 15V. So, just like the REF 6 [*HFV* May '16], the REF 6SE can be driven by any modern source and drive any modern power amp – having a standard 20kohm+ input impedance – with impunity. Sharing the same trio of Sovtech 6H30P double triodes per side as the REF 6, the overall gain (balanced in/out) of the REF 6SE is unchanged at +12.3dB as is the wide 96.4dB A-wtd S/N ratio (re. 0dBV). Distortion stays well within ARC's broad 0.01% specification but is uniformly higher (though not especially 'high') on the right channel above 330mV output – for example, just 0.0002-0.0007% (left) vs. 0.0012-0.0016% (right) from 20Hz-20kHz at 0dBV [see Graph 2].

Like the REF 5 and REF 6, the REF 6SE's response also varies with volume setting [see Graph 1, below] suggesting ARC's inter-stage buffering has not changed. The REF 6SE achieves its flattest response of -0.01dB/20kHz and -0.35dB/100kHz at full +12dB gain (103 on the display) but shows its most aggressive treble roll-off of -1.2dB/20kHz and -9.7dB/100kHz at +7dB gain (89). As the gain – not output level – is reduced still further the treble slowly picks up to achieve -0.9dB/20kHz and -8.4dB/100kHz at +6dB gain (86), -0.6dB/20kHz and -6.6dB/100kHz at 0dB gain (62) before reaching -0.14dB/20kHz and -3.0dB/100kHz at -6dB gain (41 on the display). Finally, reduced capacitive coupling within the REF 6SE has improved stereo separation to >100dB (20Hz-20kHz) in the REF 6SE versus >80dB for the REF 6. PM



**ABOVE:** Output impedance versus frequency (red) and extended frequency response (+12dB vol, black; +7dB, grey; +6dB/orange; 0dB, cyan; -6dB, green)



**ABOVE:** Distortion versus extended frequency at 0dBV, balanced line input/output (left, black; right, red)

### HI-FI NEWS SPECIFICATIONS

Maximum output/input (<1% THD)	>60V (balanced)
Output imp. (20Hz-20kHz/100kHz)	450-298ohm / 296ohm
Frequency resp. (20Hz-20kHz/100kHz)	+0.00 to -0.01dB / -0.35dB
Input sensitivity (re. 0dBV)	245mV
Input overload	>14V (balanced)
A-wtd S/N ratio (re. 0dBV)	96.6dB
Distortion (20Hz-20kHz, 0dBV)	0.0002-0.0007% (Left channel)
Power consumption	133W (3W standby)
Dimensions (WHD) / Weight	480x198x419mm / 17kg