

# Audio Research REF160M

Not just a new model but a radical change for the venerable Reference Series, the REF160M mono power amp heralds a fresh direction in both looks and performance  
 Review: **Ken Kessler** Lab: **Paul Miller**

**A** genius mix of both rebellion and restraint, Audio Research's latest chapter in the Reference saga, the REF160M monoblock power amplifier, is one of the biggest departures in the much-lauded series' evolution. Most obvious is the new look, which takes its cues from the G-Series, bringing with it a cool oversized meter, but the rest of the amplifier has been redeveloped, too, not least to incorporate features that will improve system matching, reliability, ease-of-use and initial set-up.

At £30k per pair, they seem almost sensibly-priced by today's standards, especially when you hear how they perform. Available in silver or black, a single REF160M is a fairly compact unit, at 438x254x457mm (WHD), with the handles adding 41mm; and its weight is a manageable 25.5kg. While we're on the topic of user-friendliness – and thanks to the features that are new to Reference models – actual installation is a dream. And I believe a stereo version will follow, a REF160S, should a brace of 'Ms demand too much of your space.

## CHOOSE YOUR MODE

Dave Gordon, recently elevated to Brand Ambassador, was effusive about one particular introduction to the family via this unit. By ARC standards, it is a monumental change first seen in the Foundation series' VT80. 'We wanted a reliable auto-bias circuit that would not degrade sound quality and we finally developed one. Carefully fusing the output tubes provides a great measure of protection and security.' Fittingly, this much-lauded development is a tribute to the late Ward Feibiger, who passed away last year: it was his last design for the company.

Another feature – and one which I found, after a week with the amps, to

be truly invaluable for hands-on or finicky listeners – was the choice of Triode or Ultralinear operation. It meant the opportunity to dial in memories of Dynaco or Radford amps of 50 years ago with the ultralinear choice, or turning the clock back to the Pleistocene Era with Triode.

Says Gordon, 'Triode operation is treasured by some listeners but not useable by all, so we provide the ability to switch operation between Triode and Ultralinear on the fly. And, we added the flexibility to use a single-ended or balanced source with a Reference amplifier.'

Take note of that second observation, because there are hugely desirable

control units, like early Nagra or classic Audio Research 'SP' preamps, that some might wish to mix 'n' match with modern Reference amps, but which lack balanced outputs... and purists do not like RCA-to-XLR adapters. A toggle on the back selects between the two modes, while the rear also contains speaker taps for 4, 8 or 16ohm loads and fan speed selection. The unit offers a panoply of remote power-on/off and system integration options.

## DANCING NEEDLES

First seen (I think) in the Reference 75SE stereo power amplifier, to which these were compared, the KT150 is the output



tube of choice, benefiting from the new auto-bias feature. While the auto-bias technology will accommodate other octal-based tubes, the REF160M was designed and fine-tuned for use with the KT150. When I asked if the amp could be ordered with KT88s, KT120s, 6550s or others, the UK importer snorted, 'Why? Do you want to lower the performance?'

I have to agree: the KT150 has proved to be one of, if not the finest of newborn 21st century valves. When pushed, he let out a sigh of dismay, like a Savile Row tailor being asked if he would substitute cotton for a suit's silk lining. 'We will supply other tubes, but the amplifiers will be delivered with KT150s, and prices for replacements will be dictated by market values.' His caution is understandable, with

UK charges fluctuating almost daily when dealing with American, Russian or Chinese-made vacuum tubes.

So in-your-face is the new meter that it may prove divisive. Susceptible as I am to the allure of old-style mechanical meters, with black needles against a white dial,

I admit to be taken aback by the sleek, ultra-modern look of arched scales etched into Perspex, with a big, illuminated indicator. The needle's activity was a ballet of its own as I used the amplifier through the

Wilson Yvettes [HFN Feb '17], and moved from Triode to Ultralinear, head-banging to whisper-soft. Their action was swift and the ascent followed sudden shows of bombast in the signal with confidence [but see PM's Lab Report, p39].

*'The KT150 has proved to be the finest 21st century tube'*

## THE FAMILY TREE

While this 160M wears the same 'REF' moniker as previous classics including the REF75 [HFN Nov '12], REF150 [HFN Feb '12] and REF150SE [HFN Dec '15] – the latter updated with KT150 output tubes – the design and technical performance of the new monoblock is clearly influenced by ARC's more recent models. Warren Gehl, responsible for 'sonic design', together with the late Chief Engineer Ward Feibiger coordinated the move to the beefy KT150 output tubes, used in the GS150 [HFN Jan '15], and were also the architects of ARC's first auto-bias regime, debuted in the VT80 [HFN Oct '17]. It might be tempting to compare the REF160M with the GS150 as both utilise quad sets of KT150s per channel (and their large power meters are similarly inaccurate!), but this is still the first REF model to use auto-biasing. In practice the technical performance of the REF160M is closer in execution to a balanced/bridged version of the VT80SE. In our independent tests the REF160M and GS150 offered an almost identical power output into 8, 4, 2 and 1ohm loads, but only the former combines this with the low noise and wide S/N of the VT80SE [see Lab Report, p39]. PM

**ABOVE:** Classic 'rack mount' ARC chassis but with a wide open window – complete with etched metering – on the glowing KT150s. Includes Triode and Ultralinear modes

Alongside the power on/off button below the clear fascia are buttons for the levels of illumination; tube monitoring, which uses the scales to keep an eye on valve condition; and the Triode/Ultralinear selector. Should you wish to gaze upon the lit tubes with the perforated cover in place, the meter-window frames them beautifully.

## SUBTLE DIFFERENCES

My only whinge about the front panel as a way of monitoring activity was the choice of blue and green for the LED that indicates Triode or Ultralinear operation. The unit is rated conservatively at 140W in Ultralinear mode, the power effectively halving in Triode mode, but this drop was not sufficiently audible to be a giveaway unless really hammering the hell out of the units. Instead, one has to look at the LED at eye-level while pressing the mode select button to note the colour change.

I was relieved to hear from Gordon that he agreed, so hopefully this will be more extreme in future production. Those with golden ears will, naturally, say they can hear the changes immediately, but I found the two modes to be more subtle than anticipated, attesting to the coherence of ARC's latest design.

Rather, I found the matter of Triode-vs-Ultralinear *not* to be related to the speaker sensitivity. The Yvettes were, in this respect, not a demanding choice because they're fairly easy to drive and yet will handle all manner of abuse. While I concur that →



**RIGHT:** Cover (and integral fan) removed reveals the two 6H30 driver triodes and quad set of KT150 output tubes. Auto-biasing will also accommodate lower output 6550, KT88, and KT120 tubes

## MONO POWER AMPLIFIER



**ABOVE:** Factory-matched and held in check by ARC's auto-bias regime, the two pairs of KT150 tubes are fan-cooled once the lid is in place. Two custom-made transformers are fitted – one for the PSU with three secondaries [furthest] and the other with two primaries and three speaker output taps

there are extreme choices of loudspeaker that may demand Ultralinear mode on power-related grounds, I found the changes to be music dependent.

### TRIODE OR ULTRALINEAR?

It's here that I wish Audio Research had provided some means of swapping from Triode to Ultralinear from the hot seat, for quick A/B comparisons. Because switching can be done on the fly, it's a great opportunity to compare the two modes. But to do so you need to park a willing accomplice between the two monoblocks, ready to switch both simultaneously while you stay in the optimum listening position.

Let's get this out of the way, though, with two opposing examples, as I do not want to dwell too much on the Triode/Ultralinear issue. Simply put, I found the sweetness of the Triode mode beneficial with softer performances, rich orchestral works and those with monumental brass. 'Walkin' My Baby Back Home' from Lionel Hampton's 1960 release, *Silver Vibes (With Trombones And Rhythm)* [Columbia CSRP8277], positively glowed with room-filling atmosphere when Triode was selected. It delivered, in all of its glory, golden-age warmth and authenticity.

Switching to Ultralinear, a hint of sharpness was added – not unwanted, because it also increased the attack of transients and even uncovered a trace more 'tinkle' from the vibes. In this case, I preferred the Triode configuration.

**'The REF160Ms balance sheer power with delicate nuance'**

But moving to Toto's 'Africa' and 'Rosanna' from *Toto IV* [Columbia 7464 37728-1] proved the reverse. These two audiophile favourites, while possessing much of the silkiness of the 1950s sound, are best exploited for impact, bass extension and percussion that wouldn't embarrass a Kodo master. Undoubtedly, the REF160Ms in Triode mode emphatically delivered the scale and sheer power of both tracks, but the Ultralinear setting imparted that much more 'majesty' – no other word quite captures the wall of sound it painted. So, Toto fans, go for Ultralinear when using the REF160Ms.

Why, then, you might ask, am I prepared to dismiss this aspect with a mealy-mouthed 'horses for courses' get-out clause? Simple: it's not an either/or choice. The owner of the REF160Ms will never have to suffer buyer's remorse about amplifier choice. Generously, Audio Research has given you both options.

With that established, and with all of the tracks auditioned both ways, I turned to the syncopation found in the recordings of Little Feat. It was the elegiac 'Willin'' on *Little Feat* [Warner K46072 LP] that gave me my initial glimpse of the REF160M's true greatness. Sweet, woody sounds from the opening acoustic guitar, liquidity on the right from slide guitar, resonant vocals: this screamed 'TRIODE!', right? Er, no. The listening mode simply made no difference because neither made specific demands. Neither did my biases (no pun intended) ➔

### DAVE GORDON

With the unique post of Brand Ambassador, David E Gordon is now Audio Research's roving envoy. Dave is one of the longest-serving of the company's employees, and he was the man to consult regarding the radical change to the look of the latest Reference model.

'As a mature company with an easily recognisable "look", we have been careful not to lose it, as it evolved over the years. When the first G-Series designs were shown, we were taken with them, as many details from our early classic products were blended with a more contemporary aesthetic. In the new Reference series, we combined some of the G-Series with other details that have been part of Audio Research – like our handles. We feel that the final look is more modern without losing our core aesthetic. It remains unmistakably Audio Research.'

With the visuals changing, the technical elements had to change, too. 'There are three major gains: absolute sonic performance – which always comes first – has taken a major leap forward. Ease of use and reliability have been improved. And, thirdly, we love the redefined look, especially that meter.'

Dave, in addressing the changes to Audio Research since its new ownership, emphasises continuity. 'The new REF amplifier is the culmination of developments we have accrued over the last seven years, since the last generation of Reference amplifiers was introduced. We wanted its operation and performance to be worry- and trouble-free: "Go home and enjoy the music, without thinking about it!"'



## MONO POWER AMPLIFIER



**ABOVE:** Small toggles switch between single-ended (RCA) and balanced (XLR) inputs, fan speed and auto-shut off (signal sensing). Tube hours are indicated beneath while 4mm speaker binding posts offer 16ohm, 8ohm and 4ohm-tapped outputs

beg one more than the other. I was hearing what eight KT150s could do – and it didn't sound just like a brace of mono'd REF75SE amps.

What the REF160M brings to the table is silence, backgrounds so quiet that valve haters will have been robbed of one of their main gripes. The added benefit of all that sonic blackness is improved retrieval of low-level detail and unconstrained dynamic contrasts that revealed the full sound of the acoustic guitar on 'Willin' to even greater effect. Better still was a palpable sensation of a 3D presence. Because the stage depth – aided by the supremely talented Yvettes – extended so far back, it made the room seem larger.

### A HEART-STOPPER

Time for some bombast, courtesy of 'I Thank You' from Bonnie Raitt's *The Glow* [Warner K56706]. (This sounded best with Ultralinear, because it has to punch you in the gut.) It starts with deliciously trashy drums, thumping bass and twangy guitars, a relentless procession underscoring Raitt's passionate vocals. But the heart-stopper was 'Standin' By The Same Old Love'.

Similar sound, arrangement, attack. Here, though, there's a slide guitar behind the proceedings, and an almost-militaristic drum pattern. The REF160Ms balanced sheer power with delicate nuance to a degree that, sadly, cannot be offered by low-power tube classics. Cue from 1m 45s to 2m 20, and listen closely when all accompaniment shuts off bar drums. This amplifier has assault

capabilities to threaten other amps with far more wattage.

By any measure, the real worth of this amplifier is how much it keeps you from switching it off. This is the hi-fi equivalent of a TV box set, when you think, 'Just one more episode of *Gomorrah* won't hurt' and it's 4am. I wanted to hear the crystalline vocals and matchless harmonies of The Judds' version of 'Sleepless Nights' on *River Of Time* [Curb ZL74127 LP]. It was a revelation.

Even the abysmally recorded, musically sublime, one-off from Ayers/Cale/Nico/Eno, *June 1, 1974* [Island ILPS9291], was tolerable. The system cut through the murk and the REF160Ms worked with what they were fed. And perhaps that's the highest tribute one can pay – when a system makes palatable even the unlistenable. Yes, this Audio Research amp can work miracles. ☺

### HI-FI NEWS VERDICT

As one who has used all but the most monstrosly huge Reference models during the series' entire span, and as a devotee of the REF75, I wasn't prepared for such a massive leap in capabilities. Audio Research will continue to deliver models with thrice the power, but they'll have to endow them with the '160M's grace. I suffer no hesitation in judging it one of the finest amplifiers I have ever heard, regardless of price.

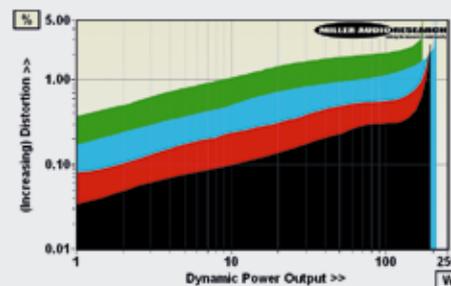
Sound Quality: 90%



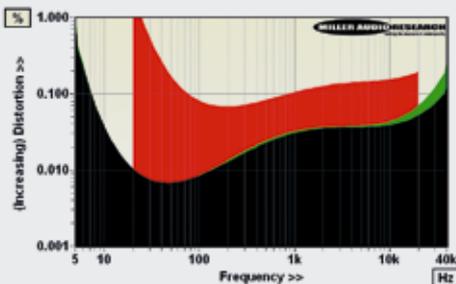
### AUDIO RESEARCH REF160M

This is not ARC's first outing with KT150 tubes, nor the first to incorporate auto-biasing, but it is the first Reference series model to utilise both [see boxout, p35]. Its 140W rating is met into 8 and 4ohm with 165W being delivered at up to 1% THD via the 8ohm and 4ohm taps. This improves very slightly under dynamic conditions to 170W/8ohm and 175W/4ohm with 200W/2ohm (<2% THD) and 165W/1ohm (<3% THD) all in the REF160M's 'Ultralinear' configuration [see Graph 1, below]. In 'Triode' mode the output falls to 82W/8ohm and 85W/4ohm with a very marginal reduction in distortion at very high frequencies [see black vs. green trace, Graph 2 below]. The meter is decorative only – 1W/8ohm (8ohm tap) reads 0.015W, 10W reads 0.15W and 100W reads 1.5W on the 'Ultralinear' scale.

The 'shaped' frequency response with its mild +0.1dB bass shelf from 300Hz down to 10Hz allied to a gentle mid/presence roll-off of -0.2dB/5kHz to -0.7dB/20kHz (and -7.1dB/100kHz) is a mildly exaggerated version of that offered by the REF150SE and GS150 as is the magnification of the trend with reducing load impedance (-1.3dB/20kHz into 4ohm and -2.3dB/20kHz into 2ohm). The 0.6-1.5ohm output impedance (20Hz-20kHz) is also shared between all three models. Distortion increases gently with output level from 0.035%/1W to 0.11%/10W and 0.5%/100W (all 1kHz/8ohm). Versus frequency, the minimum is at 100Hz (0.06% at 10W), increasing to 0.19%/20kHz. Noise is very low, extremely so for a substantial tube amp and some 13dB better than the GS150 at -83dBV (unweighted). The A-wtd S/N ratio is correspondingly wide and up with the quietest solid-state amplifiers at 101dB (re. 0dBW). PM



**ABOVE:** Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Max. current is 12.9A



**ABOVE:** Distortion vs. frequency (20Hz-20kHz, 10W, red; 5Hz-40kHz, 1W Ultralinear, green; Triode, black)

### HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	165W / 165W
Dynamic power (<1% THD, 8/4/2/1ohm)	170W / 175W / 200W / 165W
Output impedance (20Hz-20kHz)	0.69-1.51ohm
Freq. resp. (20Hz-20kHz/100kHz)	+0.1dB to -0.7dB/-7.1dB
Input sensitivity (for 0dBW/140W)	179mV / 2105mV (balanced)
A-wtd S/N ratio (re. 0dBW/140W)	100.5dB / 122.0dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.06-0.19%
Power consumption (Idle/Rated o/p)	220W / 380W
Dimensions (WHD) / Weight	438x254x457mm / 25.5kg