Stereo power amplifier. Rated at 180W/8ohm
Made by: Halcro (Longwood Audio), Adelaide, Australia
Supplied by: Sound Design Distribution Ltd, Cardiff
Telephone: 0800 0096213
Web: https://halcro.com; www.sounddesigndistribution.co.uk
Price: £40,000 (£46,000 Premium finish)

Halcro Eclipse Stereo

The original Halcro amp starred in a recent *HFN* Vault feature but, some 20 years on, the marque is back in the same iconic shape and with the same high tech claims... Review: **Andrew Everard** & **Paul Miller** Lab: **Paul Miller**

Working out the brand behind the Eclipse Stereo power amplifier isn't hard: not only is the design a modern take on the iconic Australian Halcro amps of the past [see 'From the Vault', *HFN* Dec '22], but the product itself, with the power supply and amplifier suspended between two solid uprights, forms the letter 'H' – not a trick we've seen other manufacturers attempting!

Selling for £46,000 in the Premium finish of the review unit, or £6000 less for the only slightly plainer Standard version, this latest iteration of a design that started with the original Halcro dm series around the turn of the millennium [*HFN* Apr '02] is part of a range including the Eclipse monoblocks. They are said by the manufacturer to be 'the new reference in amplification'. Quite a claim [see PM's Welcome, p21].

ORIGIN STORY

I say 'its manufacturer' as a lot has happened between those original dm models and the latest Eclipse line. Originally designed by South African-born, Cambridge-educated, adopted Australian Dr Bruce Candy – middle name Halcro – the amps were inspired by his development of metal-detection devices for the gold extraction industry, this microwave and ultrasonic technology forming part of his Minelab Electronics brand.

Halcro was born as a subsidiary of Minelab and was the result of Candy's loathing of any kind of distortion in amplifiers, and his belief that such distortions created 'ghost tones' which, while unheard as sound, could be detected by the human ear. Translating some of the thinking used in those high-sensitivity, super-accurate gold-sniffers, he was able to claim for the dm38 amp 'better than 99.9997% purity of all tones across the entire audio range'. Let's just say Dr Candy was never less than assertive in his claims, but the design went on to be developed further, and by the time of Halcro's last flagship model, the dm88, was definitely one of those 'spoken of in hushed tones' products.

However, that was then, and this is now... After Minelab was swallowed up by military comms company Codan in 2008, mainly for the potential of its detection technology in clearing mines – of the lethal rather than profitable kind – Halcro, a distraction from the operation's main business, was shelved. And on the shelf it stayed, save for a brief licensing project with Vivid Audio, smartly seen off by the (last) Global Financial Crisis, until it was revived by Magenta Audio, an Australian-based hi-fi importer and distributor.

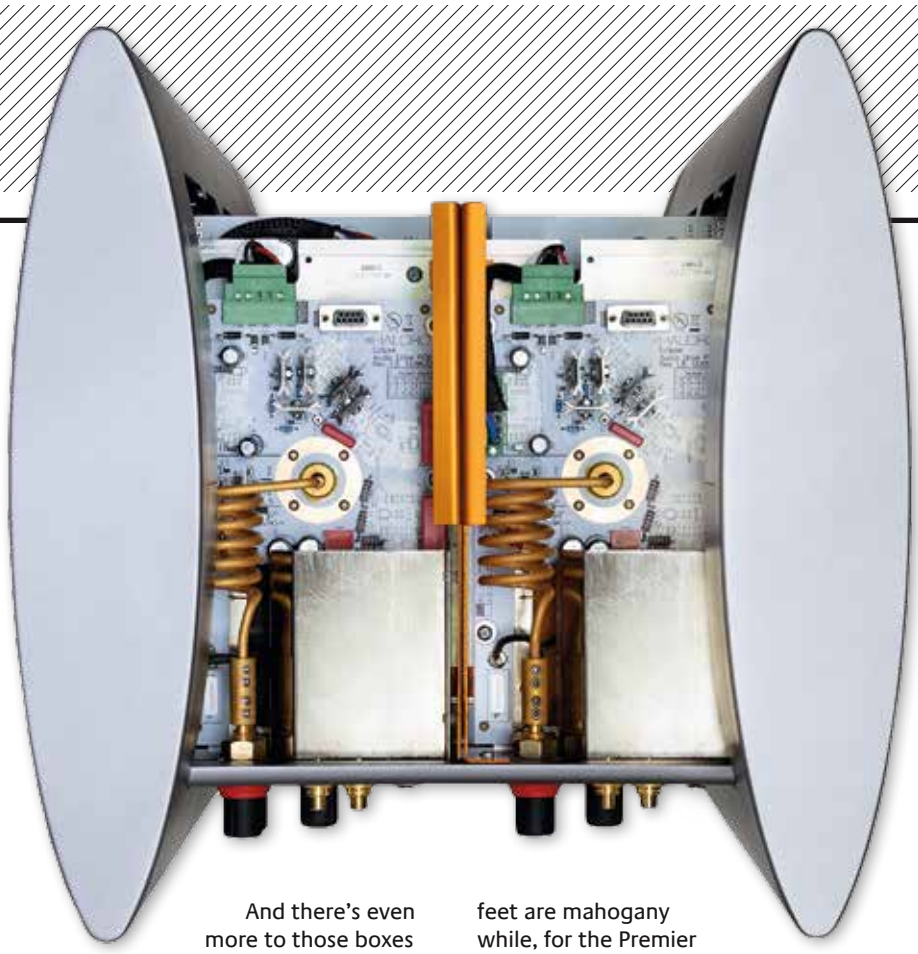
A new company, Longwood Audio, was founded with a team including Magenta's Dr Peter Foster and former Halcro lead engineer Lance Hewitt, and the Halcro brand, patent portfolio, stock and tooling – which had been sitting in an Adelaide warehouse whose lease was set to expire – were acquired.

RIGHT: Inside, seen from the front, showing the dual switchmode PSU [lower enclosure] and modular, dual mono FET power amplifier [top enclosure]. The tall alloy limbs also form part of the efficient heatsinking

A TOTAL ECLIPSE

And that brings us up to date with the Eclipse series, the result of considerable re-engineering, not to mention re-tooling and redesigning that iconic shape, which is now just a little softer and more curvaceous, finished to an even higher standard. The silver anodised casework of the old design, described by one reviewer as tending to 'ring like an old Adelaide church bell', is replaced by much heavier machined-from-solid aluminium, with the two enclosures forming the crossbars between the uprights made from aluminium sheet up to 1cm thick.


hi-finews
OUTSTANDING
PRODUCT
HALCRO
Eclipse



LEFT: Inside the top of the amplifier showing differential voltage-to-current converter input stages in screened boxes [bottom]. Note how the thick copper speaker output connections also double-up as LR filter networks

And there's even more to those boxes than meets the eye. The lower, larger housing contains the power supply, compete with IEC mains input and master power switch, while the upper section [pic, above] houses the input and output amplifier stages, each shielded from the others in more aluminium and copper. Every part of the amplifier's structure is hand-sprayed with multiple layers of aerospace-grade paint, and the whole enterprise sits on feet hand-carved from wood by a local luthier – or guitar-maker to you and me. In the standard version the feet are mahogany while, for the Premier version, they're aged Australian Redgum, apparently recycled from century-old fenceposts…

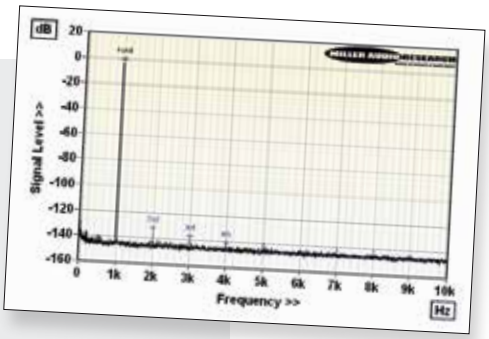
Meanwhile, many circuits have been re-laid and their components upgraded, the new Halcro maintaining the old Halcro's levels of stealth and mystery by painting over parts and enclosing vital sections in epoxy to keep their secrets (or damp them, depending on how you look at it). And with invisible fixings further serving to make the whole thing tricky to take apart – this being an amplifier to play, not to play with – all the owner really need know is where to find the pneumatic switch under the amplifier housing. With a slight hiss, from the switch, the amp moves out of standby (red light) to operational (blue light).

Cabling between the two housings is hidden in the uprights, which also disperse heat from the relatively cool-running FET power amplifier. Connections on the rear of the top (amplifier) case [see p47] accept unbalanced RCA or balanced XLR inputs, plus extra RCAs offering a half-gain mode with a very low 660ohm input impedance. The speaker cable terminals are chunky combination spade/banana types. Power output is given as 180W/8ohm, and 350W a side into 4ohm [see PM's Lab Report, p47], with extensive protection built-in against accidental short-circuit, over-current, DC offset, mains transients and quite possibly possum attack – Halcro has always been big on protecting its amps from users. Finally, the whole thing weighs a substantial 62kg, so is a two-man lift as you shuffle it into position.

H IS FOR HEROIC

For all its claims, the Eclipse Stereo genuinely delivers on its promises – so much so that a note of caution is in order. Most amplifiers produce a little (white) noise, which can be heard with an ear close to a tweeter with no music playing, but with this one there really is nothing, just silence. As a result, some care is required with the volume control on first acquaintance – full-force music just appears from nowhere when it starts playing, so it really could take you, and your speakers, by surprise.

Get the measure of how this happens, however, and the Eclipse Stereo is an absolute delight: used between the Aurender W20SE [*HFN* Mar '23], dCS Vivaldi ⊖



DESIGN NOTES

'We never release schematics', says CEO Peter Foster [see interview sidebar, p45], 'every circuit has the component designators engraved off and the boards are coated in an epoxy layer to further mask what's going on'. That's certainly true as we can see by the light-grey painted areas on Halcro's 'Audio Drive' PCB [above]. But here's what we do know about this very novel amplifier... The power supply, screened in its own independent enclosure, is a two-stage switchmode design with power factor correction (PFC). The first switchmode PSU buffers the amplifier from the AC mains by generating a very high DC voltage from which the *second* switchmode PSU delivers the rail voltages for the fully-screened power amplifier.

Meanwhile, although the building blocks of the amplifier are conventional – a differential voltage-to-current input stage, current mirror, voltage line/preamp stage and, crucially, a unity-gain power output stage employing 12 FETs – the way they are implemented, all on six-layer PCBs, is where the proprietary thinking resides. Halcro has always pushed at the limit of technical performance, now quoting a best-case distortion of –134dB/1kHz (<200 parts per billion or 0.00002%) which tallies well enough with the 0.00004% over the 2nd-4th harmonics measured with combined vector/RMS averaging at 10W/8ohm in my lab [see inset Graph]. Noise, meanwhile, is so low that the Eclipse is, to all intents and purposes, completely silent [see Lab Report, p47]. PM

RIGHT: The mains IEC socket and AC switch is located under the lower (PSU) enclosure – a red LED illuminates until the 'air pressure' switch under the upper (amplifier) enclosure is depressed. A blue LED indicates full operation


HALCRO
Eclipse

LEFT: Lattice-like side cheeks improve heatsinking airflow and provide access to the numerous bolts clamping the lower PSU and upper amplifier cases in place

APEX and Bowers & Wilkins 801 D4s [*HFN* Nov '21], the Eclipse produced a sound as compelling as it was startling. With Fred Hersch and Esperanza Spalding's *Alive At The Village Vanguard* [Palmetto Records PM2007], I was immediately taken by the intimacy of the sound, and the sheer enjoyment as Spalding speaks and sings her way through 'Girl Talk', interacting with the very present audience, as much felt during the music as heard when it reacts. Striking, too, is the way this amplifier renders the timbres of voice and piano, which is both delicate and totally revealing.

DRAMA KING

Even with a denser mix, such as Adam Lambert's lush *High Drama* [Much is More Records, 5054197308642], which has a sound befitting its title, the Eclipse gives the singer's voice absolute focus on his take on Culture Club's 'Do You Really Want To Hurt Me?' while still giving the accompaniment full value. And with his version of Noël Coward's 'Mad About The Boy' the performer is superbly delineated centre-stage, just as intended!

The other immediate impression this amplifier creates is one of massive power held under ruthless control, as is evidenced by conductor Gustavo Dudamel's self-released *Wagner* sampler with the Simon Bolivar Symphony Orchestra of Venezuela [48kHz/24-bit, via qobuz.com]. The way the amplifier hints at the drama about to be unleashed in the low opening chords of the 'Götterdämmerung' prologue is spine-chilling, but don't be too tempted to turn up the volume to listen even more closely as the final, explosive power will quite possibly rearrange your furniture. There's glorious fluidity in the brass and woodwind, and the violins as they take up the theme, with the building of volume as the orchestra swells just totally natural. It's thrilling stuff.

CAUTION TO THE WIND

All that clout and control also serves the driving beats and multiple layers of Bonobo's 'Otomo', from his *Fragments* album [Ninja Tune, ZENDNL 279]. The bass is tight, but oh so deep, and the ethereal vocal both clear and distant. Want the full deep house experience? Go on, then – crank the volume: it just gets louder, with no smear or loss of definition, but just great big pounding beats, the higher percussion clattering excellently above the low stuff, fizzing and buzzing electronica and a totally unstoppable drive. If your speakers can take it, the Eclipse will seemingly do it.

> 'The sound is both compelling and startling'

On which subject, at this point in my listening notes there's a telling line: it says, 'I don't think I've ever heard these big B&Ws driven so convincingly', and that's going some given the range of amplification we've heard fronting the 800 D4 series Diamond flagships in PM's listening room. Here, under the total control of the Halcro Eclipse Stereo, I got the impression they were really doing what they were built to deliver.

But the musical thrills kept on coming, deepening my affinity for this remarkable ⊖

PETER FOSTER

'There are about a dozen conceptual ideas behind the Halcro topology that you won't find in other amplifiers', says Managing Director/CEO Peter Foster. Fully balanced/symmetrical operation is not key to the Eclipse's incredible technical performance, however.

'We don't strive for symmetry as some designers do', confirms Peter, 'it's just not achievable when you get down to the transfer characteristics of the devices. Our output stage is not especially radical. We use complementary FETs and a reasonably high quiescent current, but it's designed to be synergistic with the more innovative stages that come before it, and the overall distortion compensation topology'.

Halcro remains coy about levels of nested feedback within the Eclipse and how it has achieved such a vanishing low output impedance. 'The bandwidth of each internal stage is significantly higher than conventional amplifiers but the bandwidth of the output stage is only marginally so', Peter swerves...

Meanwhile, a new preamp is in the wings using Eclipse-inspired circuitry, but there's no launch date as yet. 'We are also developing a range of more affordable amplifiers', Peter reveals, 'and these will sit below the Eclipse in performance but will retain a lot of the qualities that make Halcro stand out. The electronics are largely complete and we are at the stage of getting prototype casework made. I also have a couple of unusual DAC concepts that have been rattling around in my head, but these are a long way off being validated'. As ever, watch this space! PM

LEFT: Balanced (XLR) and single-ended (RCA) inputs lie alongside Halcro's gold-plated/rubber-coated speaker cable terminals. Removing the screw-down clamps reveals 4mm inserts for banana plug-terminated cables

amplifier. With The Sixteen's latest release, *A Watchful Gaze*, on its Coro label [COR16195; 96kHz/24-bit], the Eclipse illuminates both the voices and the musicianship of the ensemble as it marks the 400th anniversary of the death of William Byrd. Every note and syllable is crystal clear, and there's a wonderful sense of the voices hanging in, and decaying into, the reverberant acoustic of All Hallows, Gospel Oak.

MAGIC ACT

Similarly, with Chloe Chua's recording of the Vivaldi *Four Seasons* with the Singapore Symphony Orchestra, on Pentatone [PTC5187062, 96kHz/24-bit], the openness of the sound is as striking with the bite of the solo violin as it is with the combination of orchestral strings and organ. There's wonderful attack in the massed strings in the *allegro non molto* opening movement of 'Summer', delivering a superb sense of exuberance.

Bring it down to the intimate trio jazz of Estonian pianist Tõnu Naissoo's 'Broken Hopes', on his *Turning Point* album, remastered from the original Melodiya analogue release [APSoon Recordings APS02023; DSD64], and the Eclipse's 'maximum information' presentation is perfectly suited to the music, creating that magical 'in the room' presence. It's a trick it also pulls off with Van Morrison's rootsy *Moving On Skiffle* album [Exile/Virgin Music 4819141]. Here the old boy's world-weary voice is delivered with great character and focus, and the joyful performances of the band, with every contribution easily heard, add to the retro, light-touch feel.

This really is an amplifier for all musical styles, and entirely addictive. It may have its roots in one (exceptional) man's obsessions, and be imbued with a stack of myth and mystery, but this is a sensational revival of a legendary design, and entirely capable of rearranging your perception of music.

HI-FI NEWS VERDICT

If you're aware of the Halcro legend, the Eclipse Stereo confirms all those laudatory reviews of the past. If you're new to the brand, you'll just be blown away by the sheer confidence, poise and excitement it can deliver. This isn't just a very fine amp, with useful power and superb clarity. Rather, it's nothing short of revelatory, and with high-quality speakers will thrill and delight in equal measure.

Sound Quality: 90%

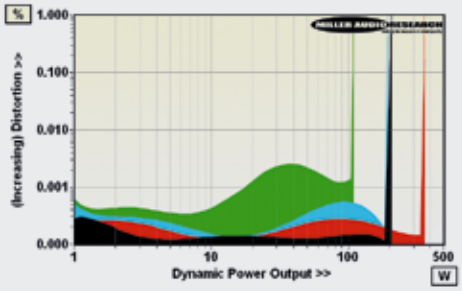
0 - - - - - - - - 100

LAB REPORT

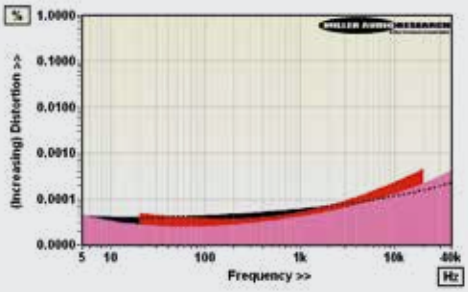
HALCRO ECLIPSE STEREO

Much about the Eclipse is truly exceptional, but it is not breaking any audiophile records for power output. Rated at 2x180W/8ohm and 2x350W/4ohm, it achieves 2x210W and 2x370W, respectively, though its clipping behaviour is very abrupt indeed. Class D and high-feedback Class AB amplifiers typically exhibit this type of behaviour, although we are assured the Eclipse is neither! The near-instant clip is readily observed on Graph 1 which shows the 'zero headroom' 210W, 371W and 195W achieved under dynamic conditions, and the current-limited 109W allowed into 1ohm. So the Eclipse is powerful *enough*, but it won't be giving D'Agostino [*HFN* Aug '22], Constellation [*HFN* Dec '19] or Michi [*HFN* Oct '20], *et al*, sleepless nights.

However, what Graph 1 starts to illustrate (within the limits of a 10-cycle/1kHz data acquisition) is the extraordinarily low levels of distortion incurred through the Eclipse [see boxout, p42]. THD is reasonably consistent with power output over the rated 180W range and is at its lowest around 100Hz at (best case) 0.00003%, rising to 0.00004%/1kHz and 0.00011%/20kHz [see Graph 2]. These are, by some margin, the lowest levels of distortion I have measured from any amplifier (and I have tested more than most in 40 years!), pushing at the limits of T&M hardware and processing software. The output impedance is phenomenally low ('Devialet-low') at 0.0015ohm (1.5mohm) through bass and midrange, conferring exceptional damping, while the response is a load-independent ±0.1dB from 20Hz-20kHz with –3dB limits of 3Hz-180kHz. The final, and equally astonishing, parameter is noise – so low that it achieves a record-breaking 106dB A-wtd S/N (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 10.4A



ABOVE: Distortion versus frequency versus power output (1W/8ohm, black; 10W, pink; 100W, red)

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	210W / 370W
Dynamic power (<1% THD, 8/4/2/1ohm)	210W / 371W / 195W / 109W
Output imp. (20Hz–20kHz/100kHz)	0.0015-0.018ohm / 0.17ohm
Freq. resp. (20Hz–20kHz/100kHz)	+0.0dB to –0.1dB/–2.05dB
Input sensitivity (for 0dBW/180W)	190mV / 2600mV (balanced)
A-wtd S/N ratio (re. 0dBW/180W)	106.3dB / 128.9dB
Distortion (20Hz-20kHz, 10W/8ohm)	0.00004-0.00011%
Power consumption (Idle/Rated o/p)	205W / 650W (5W standby)
Dimensions (WHD) / **Weight**	400x790x400mm / 62kg