

# Hybrid theory

Unison Research's Unico 90 is big and beautiful in all regards, reckons Martin Pipe.

**F**or a while now, Italian hi-fi manufacturer Unison Research has produced amplifiers that enclose intriguing 'hybrid' circuitry within an elegant chassis.

The Unico 90, the smaller brother of the 150 but a heavyweight integrated nevertheless, continues this trend. Basically, it employs double-triode valves – specifically common (and affordable!) ECC81s and ECC83s, the reassuring glow of which can be seen through the top grille – for pre-amplification and output-stage driver purposes. They are used, in Class A, to provide the amplifier's voltage gain. The 'tubed' signals are then passed to the output stage that uses three pairs of HEXFET transistors per channel, to provide the current gain that an amplifier also needs to work with speakers.

This not-unfamiliar topography

presents listeners with the best of both worlds. You get the 'valve sound' – clarity, warmth and so on – without the need for the heavy (and efficiency-sapping) output transformers traditionally associated with valve output stages. Decent-sounding transformers of this sort are not cheap to make properly, and can develop faults that are costly to rectify. That Unison's design means you don't have to replace expensive output valves when they wear out is an added bonus.

Each stereo channel employs one ECC83 (actually, a Russian-made Tung-Sol 12AX7) in the input stage, thanks to its high input impedance and high voltage gain. The lower-gain ECC81s (12AT7s), of which two are used per channel, are however better-suited to the Unico 90's output driver and phase-splitting stages. That's a total of six triodes per

channel; much use of the 'totem-pole' (SRPP, or "series-regulated push-pull") circuit technique is made in order to achieve the necessary levels of drive (its high gain and low output-impedance are a virtue here). SRPP designs were, out of interest, popular during the 1990s 'valve renaissance'.

Downstream of the valves are the HEXFETs, employed in a Class A/B configuration. They are bolted to substantial heatsinks located on either side of the chassis. Feedback is used sparingly. All of this muscle is claimed to deliver a usable 100W into a nominally 8 Ohm speaker (180W into 4 ohms). As you can imagine, the power supplies are themselves rather potent. The Unico 90 is 'dual-mono', meaning that each channel gets an independent power supply. Unusually, the two toroidal mains transformers that feed them are stacked vertically rather than



side-by-side.

The Unico 90 runs surprisingly cool. Even with no output transformers though, it still weighs in at a whopping 20kg. The appearance is unmistakably Unison, with its three-section aluminium front panel, large and silky-smooth control knobs (volume, input selection) and distinctive labelling. It's beautifully-made, too, both outside and within, having high-grade components and fibre-glass circuit boards all neatly laid-out.

Blue LEDs confirm the selected source – five in total but there's no integrated phono stage. They also indicate the valves are warming up – there's no sound for 40 seconds whilst they're flashing after the side-mounted rocker power switch has been flipped. Unison reckons that you'll get the best results ten or so minutes after switch-on. The volume control is motorised, and can – alongside source selection – be remotely-controlled with an enormous wood-encased handset with tiny buttons (it uses tiny

"It combines the sheer slam of solid-state with the innate musicality of valves to deliver a full-bodied and immersive sound"

CR2032 lithium batteries).

Around the back sits a sensible collection of terminals, all with a superb, built-to-last character. At a time when everything is packed with digital gubbins, the Unico 90 is pure analogue. A microcontroller is however used to look after protection, input-switching relays and remote control. No DACs, networking, USB or Bluetooth here. Two of the five stereo inputs are balanced XLRs, the remaining three being conventional gold-plated phonos. There's also a stereo 'bypass' input that allows the Unico 90's power amps to be fed directly.

The amp's outputs cover line-level active subwoofer (the currently-selected source unfiltered, but affected by volume control), line-level monitor (the currently-selected source, at fixed level), plus two pairs of 'speaker terminals for each channel. Instead of being independently-selected, both sets are always

active; they're wired 'in parallel' to make the job of bi-wiring speakers easier. The Unico 90 makes no provision for headphones.

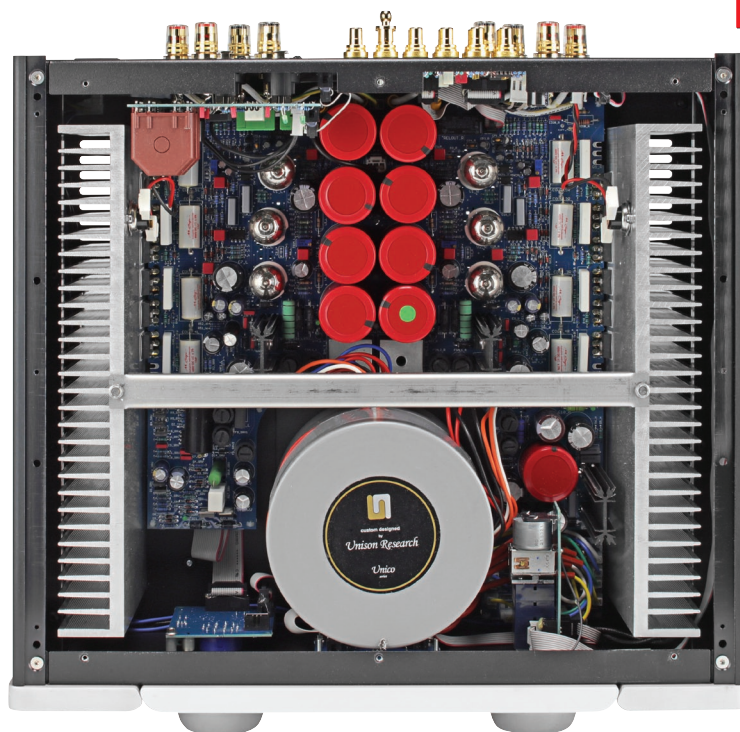
## SOUND QUALITY

My source was a Cambridge CXN streamer, which fed the Unico 90 with a selection of losslessly-compressed source material on USB or networked drives via a Chord Toby TT DAC. To turn the unit's 'hybrid power' into sound I relied on my trusty pair of Quadral Aurum Wotan VIII speakers. These are elegant floorstanders with fine ribbon tweeters that reveal plenty of 'top' detail, if it's available. The first thing you note is that, despite a spec that completely solid-state amps would sneer at (as much as 0.5% THD at 10W), is just how effortlessly gutsy the Unico 90 sounds.

The deep bassline of indytónica outfit Metronomy's brilliantly-quirkly 2008 *Nights Out* album (CD rip,

FLAC) was deliciously firm and clean even at high volume levels – and accompanied by percussion that was incisive and clear, without fatigue. Nitpicking, one might argue that despite the lack of output transformers the treble can sound just a little recessed on occasions. Boards of Canada's 'Palace Posy' (Tomorrow's Harvest, CD rip, FLAC) also demonstrated the Unico 90's natural talent for bass, rhythm and organic analogue-synth melody. In short, this amp has delightful musical panache.

Rock was also a beneficiary of the Unico's ability to deal with music. The swaggering yet joyous bluesy variety exemplified by Rory Gallagher's Irish Tour '74 (FLAC rip of MFSL CD) was here bestowed with atmosphere, definition and effortless power. Gallagher's guitar and harmonica were presented in all their searing glory, whilst drums, piano and bass accompaniment lost nothing. A live album that sounded as if you were there. Isn't that what the hi-fi game is about? The explosive Distance (FLAC) by Ceremony (aka John Fedowitz) may be an edgy and somewhat lo-fi wall of sound, and



*High-quality components are in evidence and the printed circuit boards are quality fibreglass. At front lie the toroidal mains transformers of the dual power supplies – one for each channel – stacked vertically.*



*This distinctive remote boasts numerous buttons but most have no function with the Unico 90, only volume and input select.*





**Two Tung-Sol 12AT7 (ECC81) double triodes are used to drive the HEXFET output stage of each channel.**

although not even the Unico could lay bare the musical detail it managed to put across this record's fantastic energy.

Time for something a tad more subtle – the 2009 remaster of The Beatles' Abbey Road. Ringo's unfairly-maligned drumming came across well, while Paul McCartney's bass was tuneful and well-defined. keyboards – the Hammond organ as heard in I Want You (She's So Heavy), together with the early Moog synthesiser that contributed to Here Comes The Sun and Maxwell's Silver Hammer – all emerged with their defining character intact, as did those iconic guitar parts. It was addictive; I had to tear myself away after listening to the CD twice!

Changing moods completely,



**Russian-made Tung-Sol 12AX7 valves (ECC83) perform input duties, and 12AT7s (ECC81) lie in the driver stage. Also visible are red power supply smoothing capacitors, the heatsinked output HEXFETs and miniature signal relays.**

Debussy's La Mer (BIS/eClassical, Singapore S.O./Lan Shui; 24-bit/88kHz FLAC) was also a compelling listen, courtesy of the Unico 90's musical chops. A personal favourite, the allegro Jeux de Vagues movement is made up of a variety of tonal colours that can be defined individually, as well as part of a beautiful musical picture that the 'speakers wrapped around my ears.

My final listen was to Cannonball Adderley's 1958 jazz classic 'Somethin' Else (remaster, FLAC).

Every nuance of Adderley's alto-sax or Miles Davis' trumpeting sounded vital here.

## CONCLUSION

The hybrid amplifier approach adopted by Unison for its well-built Unico 90 pays dividends. It combines the sheer slam of solid-state with the innate musicality of valves to deliver a full-bodied and immersive sound. And you don't have to worry about buying expensive output valves every few years!

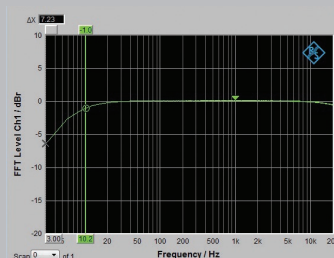


**Two of the five stereo inputs are balanced XLRs, the remainder being unbalanced phonos. There's no phono stage but Unison makes provision for an active subwoofer, line-level output and preamp-skipping 'bypass' input. Two pairs of speaker terminals are provided for bi-wiring purposes.**

## MEASURED PERFORMANCE

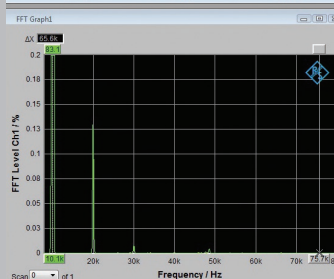
Distortion rose steadily under test and both output overload point and maximum power were not easily definable. Using a 1% distortion limit the Unico 90 delivered 90 Watts into 8 Ohms and 175 Watts into 4 Ohms, so this is nominally a 100 Watt amplifier. A low damping factor of 9 means well acoustically damped loudspeakers are best for bass control.

### FREQUENCY RESPONSE



### DISTORTION

THD at 1W	Level (dB)	Frequency
0.1333 %	1.0232 W	10.000 kHz
OFF	OFF	OFF



Distortion measured 0.13% at 1 Watt, at 1kHz and 10kHz, into an 8 Ohm load, the figure doubling to 0.25% into a 4 Ohm load, so the output stage is more load sensitive than usual. All the same these are reasonable figures, our analysis (1 Watt, 10kHz) showing innocuous sounding second harmonic dominates, high order crossover components being absent – suggesting sweet treble free of harshness.

Volume control position affected frequency response, a not unusual problem caused by capacitance across its output. At 3/4 volume the Unico 90 reached a low 15kHz (-1dB), whilst at 1/2 volume this improved to a more normal 30kHz. The amplifier will sound a tad warm with low output sources (external phono stages) but OK with high output silver disc players.

The Unico 90 is an unusual design that gives a valve-like performance. It is likely to sound very easy going and full bodied. **NK**

<b>Power (8 Ohms)</b>	<b>100W</b>
<b>Frequency response (-1dB)</b>	<b>10Hz-30kHz</b>
<b>Distortion (10k, 1W, 4 Ohms)</b>	<b>0.13%</b>
<b>Sensitivity</b>	<b>0.6V</b>
<b>Noise</b>	<b>-99dB</b>
<b>Damping factor</b>	<b>9</b>

## UNISON RESEARCH UNICO 90 £3,500



**OUTSTANDING - amongst the best.**

### VERDICT

The Unico 90 will do justice to any genre of music you care to throw in its direction.

### FOR

- smooth and musical, with effortless slam when needed
- everything you need for analogue (no phono stage)
- beautifully constructed

### AGAINST

- no facility for tape
- slight lack of 'sparkle' occasionally perceptible
- very heavy

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