

# Trilogy 931

As modern headphone amplifiers go, the sleek Trilogy 931 is one of the simplest and smartest. So does that eschewal of complication translate into superior sound quality?  
 Review: **Keith Howard** Lab: **Paul Miller**

**H**eadphone amplifiers, once a rare breed, are now on offer hither and thither. To complicate matters, they come in a variety of guises: not just large and small, svelte and ugly, but with or without onboard DACs, with or without balanced headphone outputs, with or without basic preamp functionality, etc. Never have audiophile consumers who enjoy – or are forced into – headphone listening at home had such a bewildering choice of dedicated electronics on which to drop their money.

## IT'S PURELY ANALOGUE

Trilogy's 931 is unusually straightforward in what it offers. A spin-off from the costlier 933, it's identical in its core features. It is purely analogue, so if you need D-to-A conversion it will have to be performed externally. It offers unbalanced inputs only, on two pairs of phono sockets, and a single unbalanced output via a ¼in jack socket.

So balanced signal sources and headphones with balanced wiring are not catered for, which is not unreasonable given the 931's asking price of £895 for the standard aluminium finish. With the eye-catching Mediterraneo Blue cover of the review sample (finished in a paint used by Maserati) the tariff rises to £1070 but the result is unquestionably classy looking, compromised only by the black Torx-head fasteners at the top front and rear of the wrap-around enclosure.

To the left of this is a milled-from-solid aluminium heatsink that thankfully lacks the sharp edges typical of off-the-shelf finned items (and, as Trilogy points out, their mechanical resonances too). This hints at a high standing current in the single-ended Class A output stage [see box-out, p61] and verified by the 931 running quite warm, once it has been powered for a while. I measured the heatsink temperature as about 45°C with

the 931 mounted on an open shelf at an ambient air temperature of 22°C, a modest differential of 23°C.

Nevertheless it'll pay not to site the 931 anywhere where the free flow of cooling air is restricted. This advice is repeated in the user manual, together with injunctions to keep the 931 away from sources of heat such as radiators or direct sun – to which might be added 'other Class A amplifiers'.

Placement on a 'high performance equipment platform' is recommended, as is the use of mains conditioning, specifically the products of Trilogy's sister company Isol-8. Full performance, the manual says, is achieved about 20 minutes after switch-on.

The 931 is pretty compact compared to the likes of, say, the Teac HA-501 [*HFN* Apr '14] or Aurorasound Heada [*HFN* May '15] but isn't as dinky as the diminutive Meridian Prime [*HFN* Feb '14]. Deep and narrow, it takes up little shelf width but places the rear panel as far back as larger equipment, which helps tidy up the wiring.

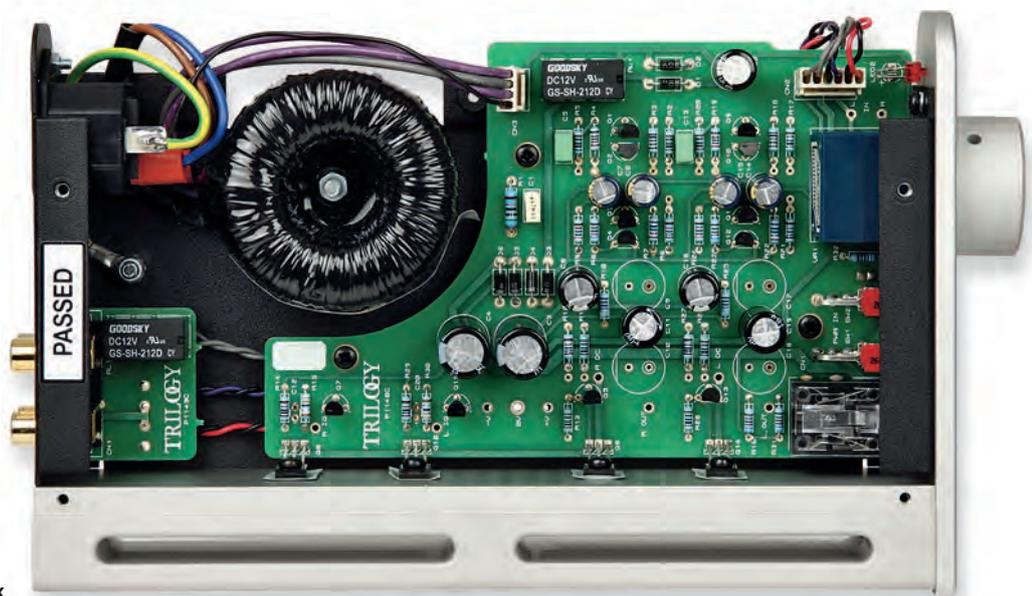
On the back panel there is an IEC mains socket and the two pairs of phono sockets for inputs 1 and 2 – no output is provided, so the 931 cannot double as a simple preamp for feeding a power amp

and loudspeakers. On the fascia there are just two small toggle switches – one (left) for power on-off and the second for input selection – plus a volume control knob of big enough diameter for large male fingers to grasp easily. To the right of the volume control is a red LED power indicator.

## A NOTE OF CAUTION

Delivering a specified 800mW into 60ohm [see PM's Lab Report, p63], the 931 is capable of rendering ample sound pressure levels with the vast majority of headphones, even on the short-term transients of high dynamic range source material. Interestingly, the 931 user manual includes a guide to recommended exposure times at high sound pressure levels, and counsels the use of caution when setting headphone listening levels.

While some buyers may resent this as nannying, my own opinion is that it's a message of such importance that it bears frequent repetition. As we face the prospect of a generation of younger headphone users suffering premature hearing loss as a result of listening at excessive SPLs for extended periods, nobody in the audio industry should shirk



**RIGHT:** Internal layout is neat with a quality toroidal transformer and ALPS volume control in evidence. A pair of NPN transistors per channel are mounted on its (left hand side) alloy heatsink



**LEFT:** Compact fascia of the 931 offers just the simplest of controls: an on/off switch, an input selector switch and a volume control knob, with red LED power indicator to its right

running Windows XP and JRiver Media Centre v19 acted as the music server, feeding a TC Electronic Impact Twin FireWire audio interface that in turn fed S/PDIF signals to the Chord.

Headphones were an Audio-Technica ATH-ES88 and JVC HA-SZ2000.

#### CLEAN AND SPACIOUS

A few weeks ago while visiting Meridian Audio's HQ in Huntingdon I had my first proper opportunity to experience MQA (Master Quality Authenticated), Bob Stuart's and Peter Craven's radical rethinking of hi-res digital audio [*HFN* Apr '15]. One of the pieces played to me was 'How Long Blues' from Ray Charles' and Milt Jackson's *Blues Brothers* album. As I revelled in the natural timbres and uncontrived spaciousness of the recording and luxuriated in the matchless musicality of the performances, I found myself wondering anew at how such fine sound could be captured over 50 years ago.

The MQA version I'm going to have to wait patiently to be able to experience at home, but I snapped up the HDtracks 192kHz/24-bit download almost as soon as I got back. I'm not claiming for a moment that the non-MQA, headphone experience is equally exceptional because it isn't, but still this is a recording which, reproduced well, is irresistible.

And the 931 did a very creditable job of conveying all its fine qualities. Spacious, detailed and natural, its sound was only a couple of notches down on the best I've heard from a headphone amplifier at any price. While it didn't quite serve up the ultimate in image dimensionality or sheer resolution, you'd have to have heard or owned a very high-end amp to perceive any shortfall. The overwhelming imperative was just to sit back and enjoy.

Another new acquisition chez Howard is something I never imagined buying – the *Higher Ground Hurricane Relief Benefit* ➔

the responsibility of offering good advice on this important topic.

In its brochure for the costlier 933 TrilogY has this to say on the subject of headphone amplifier design: 'The task of moving the delicate membrane of a headphone driver is a very different to energising the reactive complex impedance of a multidriver loudspeaker. With much less mass to move and without the masking of listening environment and room interaction, the small signal integrity of an amplifier becomes even more critical than that of a regular power amplifier.'

It's a persuasive argument and yet all the headphone amplifiers I've heard have sonic signatures which are paralleled in power amplifiers for loudspeakers. Like headphones themselves, some have whip-crack dynamics and the ability to deliver minute insight into both the recording and

the musical performance, whereas others take a step back and deliver a more relaxed and less intimate account of events.

Of course, these are the extremes of what is actually a spectrum of sonic qualities but if I had to characterise the 931 as one or other I'd say it inclines a tad to the reserved presentation. It doesn't,

*'I was instantly transported back to the fifth-form common room'*

for instance, possess the magical mix of transparency and tonal warmth that I so loved in the aforementioned Aurorasound Heada – but at about a third of the price it would be unreasonable to expect

it to. The 931 delivers clean, sophisticated sound but doesn't quite serve up the ultimate in resolution and excitement. For that you probably need turn to the 933 – though I've yet to hear this model.

For my listening, the 931 was fed analogue signals from a Chord QuteHD DAC. A second-generation Mac mini

#### **PUSH MINUS PULL**

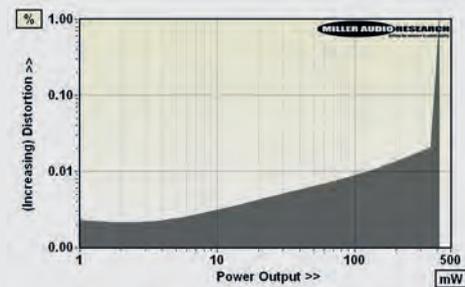
**For many years until the resurgence of single-ended triode amplifiers, the thought of using anything other than a push-pull output stage in a power amplifier – even a low-output Class A one for headphones – seemed bizarrely archaic. Push-pull output stages, which I've likened before to a two-man saw, have distinct technical advantages, such as improved efficiency and driving of capacitive loads. One of these is that they cancel even-order distortion, so that 2nd, 4th, 6th, etc, harmonic and intermodulation products are significantly reduced in the output. But in an article entitled 'Amplifier Musicality' [*HFN* Mar '77], the legendary Jean Hiraga questioned whether this really is advantageous, suggesting instead that a full complement of even- and odd-order distortions, of reducing amplitude with increasing order, results in better sound quality. Controversial as that claim remains, single-ended output stages – like that used in the 931 – are now often favoured over the conventional push-pull alternative.**

# LAB REPORT

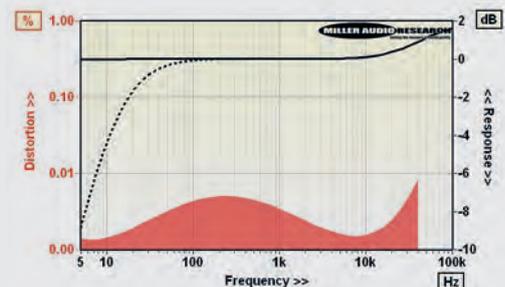
## TRILOGY 931

This is a perfect blue-sky opportunity for a single-ended/single-transistor (necessarily Class A) output stage designed to drive a load that's less taxing/current hungry than a fully-fledged loudspeaker. The A-wtd S/N ratio is adequate at 88.2dB (re. 0dBV) and the 800mW/60ohm specification is met by the 500mW/25ohm measured in my lab (assuming a current limit of 0.14A). The maximum 10.22V output available for high impedance 'phones is equivalent to 350mW/300ohm. However, innovative though this single-transistor stage is, there remains some thermal drift: its maximum power output falling to 445mW/25ohm once the unit is on and 'cooking' after an hour or so [see Graph 1, below].

Distortion otherwise follows a consistent pattern, increasing gently with output from 0.002% at 10mW, 0.006% at 100mW, 0.01% at 300mW and 0.02% at 400mW/25ohm. Distortion increases at low bass frequencies under load from 0.003%/20Hz at 1V/1kohm to 0.0065%/20Hz at 1V/25ohm (40mW) and to 0.05% at 5Hz [see shaded traces, Graph 2]. This is mirrored by a load-dependent bass roll-off that increases with reducing headphone impedance, reaching -1.7dB/20Hz at 40mW/25ohm [see responses, Graph 2]. Of course, with the excessive bass output exhibited by many headphones, this is no bad thing. The ultrasonic response meanwhile stretches out to 100kHz ±0.05dB. Furthermore the fabulously low <1ohm source impedance minimises any chance of further amp/phone response variations. Readers may view a comprehensive QC Suite test report for Trilogy's 931 headphone preamp by navigating to [www.hifinews.co.uk](http://www.hifinews.co.uk) and clicking on the red 'download' button. PM



ABOVE: Continuous power output vs. distortion into 25ohm 'headphone' load (black, cold; red when 'hot')



ABOVE: Freq. resp. from 5Hz-100kHz (black) and into 25ohm (dashed) with distortion versus frequency (red, 1V; shaded, 40mW) from 5Hz-40kHz

## HI-FI NEWS SPECIFICATIONS

Maximum output (re. 1% THD into 47kohm)	10.22V
Max. power output (re. 1% THD into 25ohm)	498mW (445mW, hot)
Output impedance (20Hz-20kHz)	0.9-0.9ohm
Maximum gain	+20.4dB
A-wtd S/N ratio (re. 0dBV)	88.2dB
Frequency response (20Hz-20kHz/25ohm)	-1.7dB to +0.00dB
Distortion (20Hz-20kHz, re. 40mW)	0.0045-0.0065%
Power consumption	12W
Dimensions (WHD) / Weight	140x50x244mm / 1.6kg



ABOVE: No digital inputs here as the Trilogy 931 is analogue from input to output. Two RCA ins are offered, switchable via a toggle on the front panel

Concert [EMI/Blue Note 0946 3 45238 2 0] – until I heard one track from it and simply had to acquire it: Norah Jones' live performance (just voice and piano) of 'I Think It's Going To Rain Today'. This is far and away the best version I've ever heard of the Randy Newman protest song, so apposite in the context of the New Orleans disaster and a perfect showcase for Jones' velvet voice.

### BACK TO THE CLASSROOM

Again the 931 delivered the essential qualities of what is only a 44.1kHz/16-bit recording but the best sounding track on the CD. Unadorned with unnecessary EQ and unfettered by any noticeable dynamic range compression (there is just a little limiting on peaks), it's a modern demonstration of 'less is more' that the Trilogy did little to impede. Once again the sound was spacious, clean and blessed with wide dynamic range. I bet many there at the Lincoln Center that day in 2005 didn't experience it sounding this good.

My classical music selection included part of Tchaikovsky's *Serenade For Strings* played by the Scottish Ensemble [Linn Records CKD 472], a free 44.1kHz/16-bit download via the Hyperion Records monthly sampler in March. This isn't the clearest or the airiest recording you'll ever hear – probably it sounds significantly better in its hi-res versions [see review *HFN* Aug '15] – and the muscular opening with its big chords might have benefited from more resolving power than the 931 brings to bear. But this reserve is part of the 931's core makeup.

As I've probably recounted before, I don't spend much time

listening to the soundtracks of my youth. My salad days, when I was green in judgment have, I hope, been superseded by a better and broader musical taste. But certain albums from that period do exert an almost gravitational pull, and earn a place in my collection because of it.

I've never owned the eponymous Santana album previously – *Abraxas* made the bigger impression on the 16-year-old me – but I remember it being played endlessly in school when I was studying for O-levels, and so when I saw HDtracks' download of it recently I succumbed.

Nobody is ever going to call this an audiophile recording, even at 96kHz/24-bit, any more than *Abraxas* is – but that heady mix of Latin rhythm and heavy rock still casts its spell. Via the 931, 'Jingo' proved as evocative as the scent of a summer evening: the bass was deeper than I ever heard in 1969/70 and the percussion crisper, but I was transported straight back to the fifth-form common room. ☺

### HI-FI NEWS VERDICT

The Trilogy 931 is a good looking, well-constructed and fine-sounding headphone amp, albeit one which hasn't the ultimate transparency and spatiality to trade punches with the very best. It lacks bells and whistles but for many potential buyers it has everything they need, making its simplicity a virtue along with its compactness compared to certain competitors. And for patriotic Brits, it's made in the UK.

Sound Quality: 81%

