IN REVIEW:
BENQ W3000 HOME THEATRE PROJECTOR

AFTER A RANGE OF ENTRY LEVEL PROJECTORS, BENQ HAS RELEASED A MID-RANGE SOLUTION. **STEPHEN DAWSON** CHECKS IT OUT.

BenQ has been hitting it pretty big with low cost Full HD projectors lately. And now it has added to its line up a mid-priced model that is flexible enough for use either permanently installed, or for impromptu use on special occasions: the W3000.

WHAT IT IS

As is BenQ's habit, the W3000 employs single chip DLP technology. That is, a Digital Micromirror Device, with somewhat over two million physical mirrors, each hinged at one, controls the light from a lamp to project the image. Since it uses a single such device, the colours are produced by showing the colours in turn, rather at the same time.

The human eye's persistence of vision does the job of merging the colours together appropriately. The mirrors on a DMD typically flicker to and fro at around a thousand times per second. The colour wheel, which in this projector has six coloured segments – RGBRGB – spins at six times the basic speed to allow the sequence of colours to display together in a very brief interval.

Early DLPs with slower timing tended to produce the 'rainbow' effect, where flashes of RGB stripes would appear in the viewer's peripheral vision. High speed colour wheels reduce or eliminate this.

Of course it offers a full HD display of 1,920 pixels across by 1,080 vertically. It supports all the usual signals other than UHD/4K. It also does 3D, although you'll have to purchase the 3D eyewear as an extra. While on the subject, I should mention that the projector has a 3D sync connection. You generally won't actually need this: the infrared signal that synchronises the LCD shutters in the glasses with the picture will normally be bounced by the projector from the screen back to the eyewear receiver. But it does mean that installations where the geometry is not working properly for some reason

can be dealt with by adding a front sync emitter.

The projector is fairly flexible in installation, with a 1.6:1 zoom range and a modest amount of vertical and horizontal lens shift. To fill a 100" screen the projector needs to be placed at any distance from 2.546m to 4.118m. The centreline of the lens needs to be a bit below the bottom of the screen (or a bit above the top if ceiling mounted).

It's fairly compact and light in weight (4.2kg), so ceiling mounting doesn't require excessively strong mounting points.

The projector packs a couple of speakers on its sides, each with 10W of power. There are two HDMI inputs, plus support for most legacy connections other than S-Video. An audio out socket allows stereo audio fed to the projector via HDMI to be routed to an external audio system rather than the built in speakers, should you desire. I used the unit conventionally: HDMI from source to home theatre receiver and then to the projector, carrying only video in that second section.

The lamp life is rated at 2,000 to 4,000 hours depending on the brightness setting used.

IN USE

BenQ notes that this projector implements the Rec. 709 colour calibration (Rec. 709 actually includes a number of other standards as well, but these are typically handled well by home theatre projectors anyway). The point of this is that this is the same standard used by the vast majority of cameras and within the processing line for video and movie production. So, of course, what you see on your screen will match the colours intended by the content makers.

Certainly, the colour balance produced by the projector was excellent. Even and precise, resulting in an excellent rendition on Blu-ray content, but equally good on DVDs and digital TV, both SD and HD. It turns out that BenQ actually does a production line quality check on Rec. 709 compliance for every single unit.

The 'Rec. 709' picture mode setting was equally good on the white-to-black scale. Some 256 brightness levels are theoretically available on DVD and Blu-ray. But some at the bright end and some at the dark end are not used for historical reasons, leaving 220 levels actually in use. The projector was calibrated, out of the box, so that the brightest

SPECIFICATIONS

Display technology:	1 x Digital Micromirror Device (size not stated), 1,920 x 1,080 pixel resolution
Lamp:	260W
Lamp life:	2,000/3,500/4,000 hours (Normal/Economic Mode/ SmartEco Mode)
Brightness:	2,000 ANSI Lumens
Contrast ratio:	10,000:1
Inputs:	2 x HDMI (1 with MHL) 1 x component video 1 x composite video 1 x D-SUB15 2 x stereo audio in
Other:	1 x stereo audio out 1 x RS-232C 2 x USB 1 x 12V trigger 1 x 3D sync
Dimensions:	330 x 128 x 257mm
Weight:	4.2kg

actual white matched the level of the theoretically brightest white, while the actual darkest black was just as dark as theoretical max-black. To be particularly picky, there was a very slight mauve shift at around 95% white, but this was visible only on test patterns. I watched a couple of black and white movies, and not once was this apparent.

The focus was excellent, easily set and very even from corner to corner of the screen. The brightness was excellent. My 83.5" screen was small enough to allow the production of a bright image with the 'Economic' picture setting. This reduces brightness by around 30%, and also reduces the cooling fan speed, making the projector very close to silent.

BenQ specifies a contrast ratio of 10,000:1, and with projectors this is typically determined by the deepest blacks the projector can manage rather than the maximum brightness. I've been a bit spoiled with blacks,

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lately, having been using a large screen OLED TV (which can go all the way to complete black – no light production at all). By, er, contrast, the black levels of this projector were modest. However, by comparison to most projectors they were more than adequate, and better than what you typically see in the cinema.

Interestingly, the 'Rec. 709' picture mode setting does not invoke the motion smoothing system. This mode really is all about accurately delivering the picture as presented, not trying to 'improve' it.

I normally wind down the 'Sharpness' control of projectors and TVs because their default settings do significant damage to picture quality, introducing a nasty ghosting distortion around hard on-screen edges. But BenQ seems to have its own unique sharpness processing which avoids this. It actually sharpens without distortion. That said, sharpening can make smooth curves and diagonal lines become jagged, so

it's still worth winding down a bit at least, but it's far more usable than most.

Unlike the lower cost BenQ projectors, the W3000 includes a 'Motion Enhancer'. This takes incoming frames and interpolates new ones to go in between them, thereby eliminating frame judder. (Because DLP projectors switch much faster than LCD projectors, judder tends to be more visible with these.) The 'Low' setting reduces most judder while producing minimal distortion. 'Middle' and 'High' produced some

visible 'heat haze' distortion, along with other visible distortion around the boundaries between moving and static objects.

When fed with interlaced video from Australian DVDs (ie. at 576i50) the projector did a fine job of determining whether film or video mode deinterlacing was appropriate, and applying it. In video mode it used a motion adaptive system to optimise resolution in the static parts of the

picture. This performance would also be applicable to SDTV content fed to the projector at native resolution. It was less good with 1080i (i.e. HDTV and the occasional Australian Blu-ray discs). It occasionally misinterpreted film-mode content as video mode, introducing visible artefacts. Most particularly this was obvious in rolling credits on 1080i50 Blu-ray.

BenQ provided a set of 3D eyewear to assist with the review. As I expected, there was superb crosstalk (ghosting) rejection in 3D. As a result there was nothing to distract from or break up the sense of immersion in 3D. DLP remains unsurpassed with 3D. The only improvement would perhaps be a touch more brightness.

The glasses were chargeable, but light and comfortable to wear.

CONCLUSION

BenQ is clearly on a winner here: the W3000 is compact, reasonably priced and can be used with confidence that the colour calibration is spot on. ⬛

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