



# Flexible, compatible and accurate

**Professor David B Henson** unveils the new Henson 8000 perimeter, which is a departure in both design and function

**T**he Henson 8000 (Figure 1) is the latest of a long line of perimeters dating back to 1986 when computerised perimetry was in its infancy. Over the past 24 years there have been enormous advances in perimetry and the role of optometrists in the detection and management of disease. The Henson product range has continually evolved to both meet these new demands and to fully utilise the latest developments in perimetry/computers.

The recent rise in shared care programmes, fuelled by the recent NICE guidelines, has increased the demand among optometrists for a fast threshold test that is compatible with those used within the hospital eye service. To meet this demand the Henson 8000 has an additional new threshold test called ZATA (zippy adaptive threshold algorithm). It has also adopted the standard testing conditions and the standard printer output to aid comparisons between data collected with this instrument and that collected within the HES.

Until now, the Henson range of perimeters has focused on providing fast (less than five minutes for both eyes) supra-threshold programs. These programs (multiple and single stimulus) are easy to use and have been widely adopted by UK optometrists. They have been used in several epidemiological studies, both in the UK and abroad, and are often used to routinely screen patients over a certain age when they attend an optometric appointment. In comparison to other perimeters the supra-threshold tests of the Henson perimeters are much more flexible.

- You can use single or multiple stimulus presentations
- You can extend the number of test locations
- You can re-test locations and add new test locations to confirm findings.

To be able to confirm that a test location is damaged is very important when screening for visual field loss. Patients with no previous experience of perimetry often miss a stimulus and without a mechanism for verification of a miss (by either adding additional stimuli or re-testing) it is impossible to differentiate between false positive and



**Figure 1**  
**The Henson 8000**

true negative responses. This can lead to unnecessary referrals and anxiety for patients. The new 8000 continues to offer these well established supra-threshold programs along with a DVLA approved drivers test.

While screening for conditions such as glaucoma is still a very important role for optometrists – after all they are responsible for the detection of around 95 per cent of cases – an increasing number of optometrists are becoming involved in either referral refinement or the co-management of glaucoma (shared care). When it comes to the management of glaucoma, threshold rather than supra-threshold tests should be used. Threshold tests provide an estimate of the patient's sensitivity at each test location and provide a better means for monitoring changes in sensitivity – ie is the defect progressing? Of course there is a cost for this; threshold techniques take longer to perform which is why they are rarely used to screen for disease.

When getting involved in co-management schemes it is important that all parties use similar tests with standard printouts. Standard printouts make it easier for all members of the scheme to share data. It can be very difficult to detect progression when one party is using one type of test and the other a different one or one that produces a different type of printout.

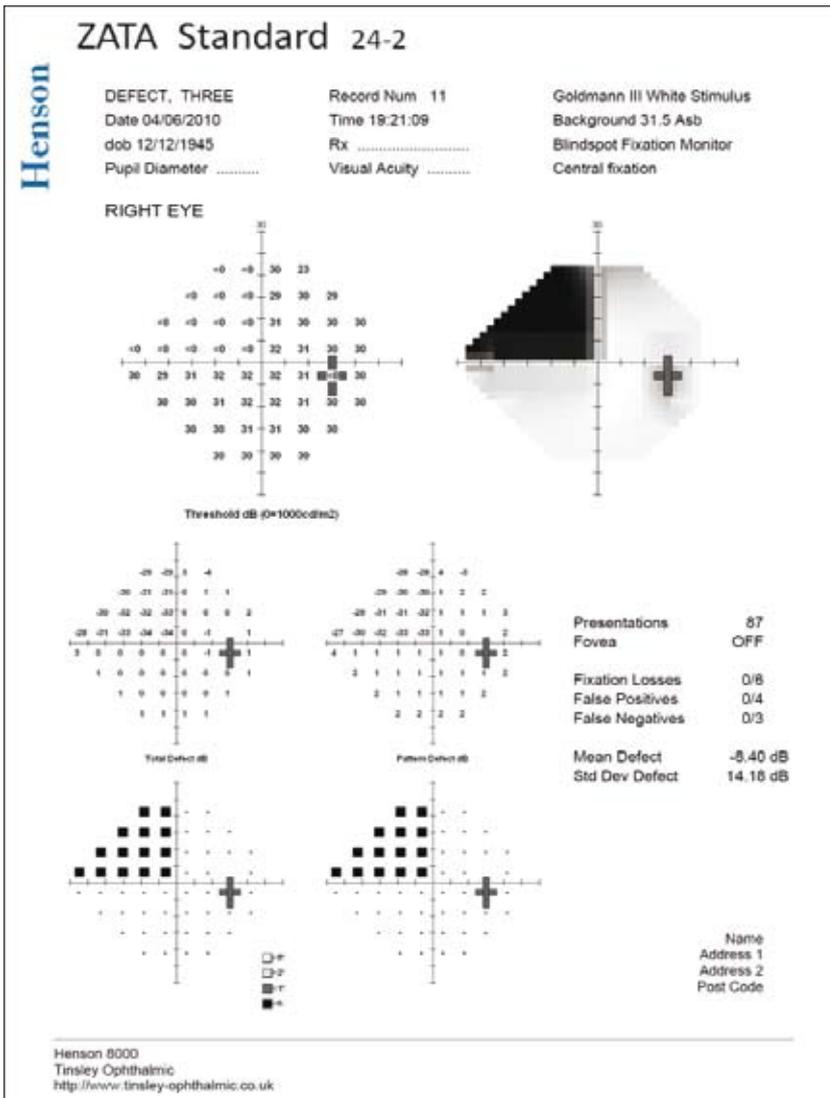
The earlier Henson perimeters included two threshold programs (full threshold and fast threshold). However, these programs did not use standard parameters or provide the standard printout. These tests also took longer

to perform than the SITA programs used in the Humphrey Field Analyzer (HFA).

The new Henson 8000 addresses these shortcomings. Its threshold tests now use standard parameters (background intensity 10cd/m<sup>2</sup>, 24-2 and 10-2 stimulus distributions, dB scale matching that of the HFA, defect and pattern deviation scales matching that of the HFA). It includes two new threshold programs ZATA Standard and ZATA Fast. The ZATA tests are much faster than the old threshold programs. They work on the same principles as the SITA test in the HFA but incorporate a number of important refinements that increase the speed of the test and the accuracy of its threshold estimates.

The first of these changes is that, when available, the Henson 8000 will use the findings from a previous test to set the starting intensity of each test location. If you can imagine a case where there is a large superior visual field defect then the Henson 8000 will start testing this damaged area with bright stimuli. This will reduce the number of presentations needed to find the threshold and hence speed up the test. Optometrists already familiar with threshold testing will know that the time taken to complete the test increases when there is a defect. This is because current threshold tests always start from normal age values rather than prior data. When you start from the previous threshold estimates the test times are fairly constant irrespective of whether or not the patient has a visual field defect. In cases where there is no prior data then the Henson 8000 will start testing at the normal age values. Using prior data not only speeds up the test it also results in a more accurate threshold estimate. It extends the concept behind the development of the SITA tests which is to use as much prior data as possible to optimise the test.

Using prior data in patients with significant visual field loss also helps the patient. It will reduce the number of non-seen stimuli. Patients find it very difficult to do a visual field test when there is a long sequence of non-seen stimuli. They get anxious when they do not see any stimuli and are increasing likely to press the response button in error, a false positive response. This leads to errors in the final threshold that often manifest themselves as sudden improvements in sensitivity in previously depressed



**Figure 2**  
Printout  
from Zata  
test

the patient details in one place and all the test details in another rather than mixing them up. While it is envisaged that most practitioners will use the ZATA test in preference to the full and fast threshold tests we have retained these for backward compatibility.

All new 8000s have a video camera fitted that displays an image of the patient's eye on the perimetrists monitor so that they can check fixation/alignment. Monitoring a patient's fixation is very important. While some patients maintain excellent fixation others are continually moving their eyes and need constant reminders to keep looking at the fixation target. The Henson 8000 also automatically checks fixation. However, it is important to realise that automatic fixation monitors and eye movement recorders are unreliable often giving a false estimate of fixation performance. The most widely used method occasionally presents a stimulus in the blind spot area and reports the number of times this is seen. This technique can give false measures when the blind spot is incorrectly located at the beginning of the test. A perimetrists estimate of fixation performance obtained from observing the patient's eye is much better measurement of fixation performance.

The Henson 8000 is operated through a touch screen attached to the instrument and its computer, which is running in the MS Windows environment, is built into the perimeter, reducing the need for lots of cables and power sockets. USB ports allow the fitting of a keyboard which can be helpful when inserting patient details. Working in MS Windows (XP) gives many advantages. For example, the 8000 will work with practically any printer (including Wi-Fi enabled ones) and will print on any size of paper. The results from a visual field test can be saved in a database that can be located on the internal disc drive or on a network drive. When networked several 8000s can use the same database and charts can be linked to practice management systems.

The Henson 8000 is designed to be used with a special perimetric lens set that fits large diameter lenses and an occluder to a brow bar (Figure 3). This is then placed on the patient's head. This system reduces the number of lens rim artefacts, is more comfortable for the patient and does away with the need for a separate occluder. ●

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regions of the visual field.

The second change that we have incorporated in the ZATA test is to adjust the accuracy of each threshold measurement according to the threshold. Let me give an example. If we had a patient who has lost his superior visual field then do we need to carefully measure the sensitivity in the blind part of the visual field or could we just do a quick test at these locations while concentrating our efforts on those areas where there is some residual sensitivity? This is what the Henson 8000 does. If the sensitivity is very low (<10dB) it does not try to get a super accurate measure of the sensitivity. Similarly, if the sensitivity is well within the normal limits it does not bother trying to get a super accurate measure. Where it does go for an accurate measure is when the sensitivity is below normal values and above 10dB. These are the locations where change is likely to occur. It also goes for an accurate threshold estimate at locations which border damaged



**Figure 3** The brow bar, occluder and correcting lens for use with the Henson 8000

areas. This is why we have called the test 'Adaptive', it adapts how accurate it needs to be according to the threshold.

The Henson 8000 has adopted the standard printout for all its threshold tests (Figure 2). The only difference between this printout and that used in the HFA is that we have put all