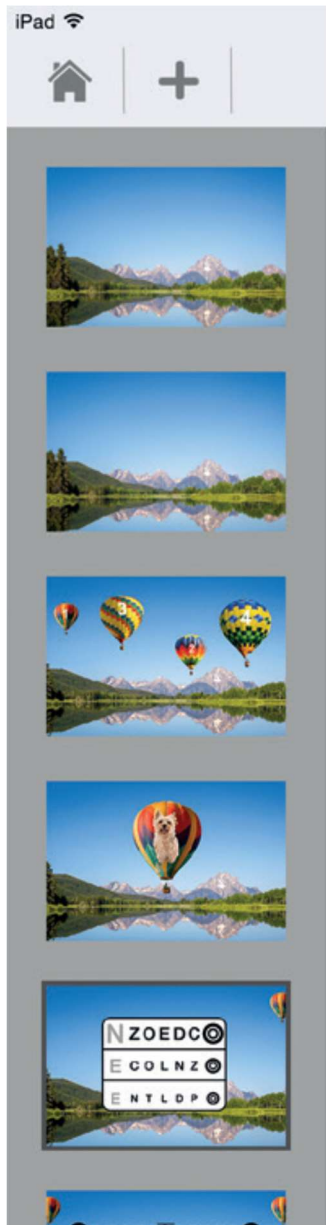


PASKAL 3D  
**GUIDED**  
REFRACTION WITH  
THE STANDARD TEST SERIES  
BY FRITZ PASSMANN AND DIETER KALDER - TRANSLATION H. GENTNER

## PREPARATIONS

- Put the result of the auto-refractometer measurement or the values of the old spectacles in the trial lens or in the Phoropter
- Activate the circular polarised filters in the Phoropter or insert them into the first rear insert of the trial lens, right in 135° and left in 45°.
- Ask the customer to keep both eyes open throughout the entire refraction.

### ROW OF PICTURES



Touching an image displays the test on the screen.

### ROW OF BUTTONS



Forward



Backward



Invert the polarisation



Select optotypes



Change from right to left eye and binocular



Larger optotypes



Smaller optotypes

Only those buttons are active that can be used for the respective test.

## TEST 1

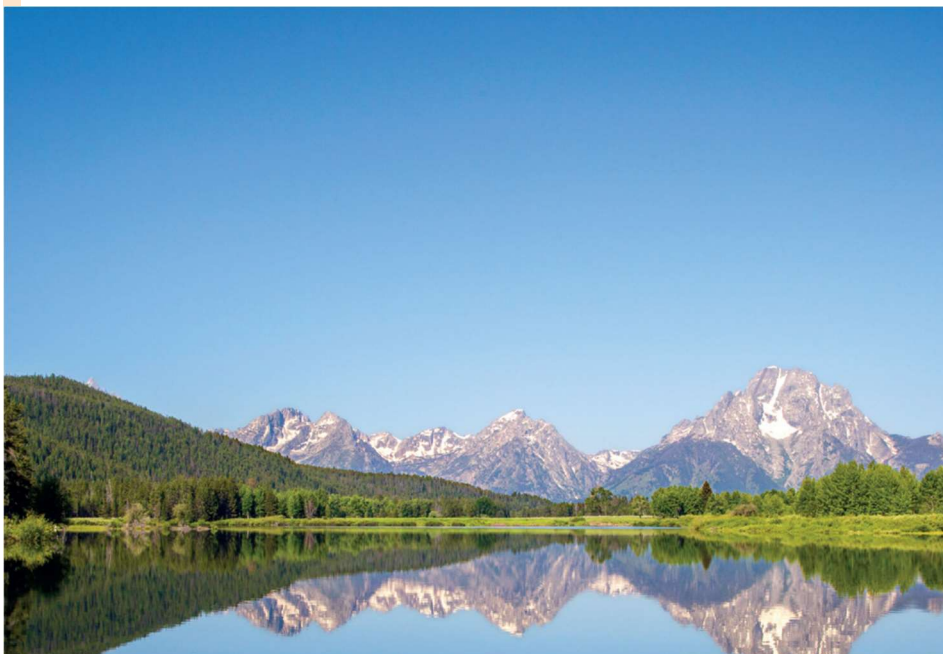
Landscape 2D, Landscape 3D



View 2D image:

**"Take a relaxed look at the picture.**

**Do you see the snow on the mountains?"**



Switch on the 3D image, ask an open question:

**"What has changed? What impression do you have now?"**

## TEST 2

Screening of binocular vision with 4 balloons



Balloon 1 is in the very back, 2 is in the back, 3 is in the front, 4 is in the very front

**"Are all the balloons equally recognizable?  
or one appears restless or unclear  
or maybe double?"**

1+2 poor / restless: suspicion of esophoria

3+4 poor / restless: suspicion of exophoria

altogether restless: suspicion of height phoria

## TEST 3

### Dominance test

**"In the next test, you will see only one balloon. There's a dog or cat hidden in it."**

**"Please make a blink and keep both eyes open!"**

Do not switch on the picture until the test person has been informed.

Determine dominant eye:

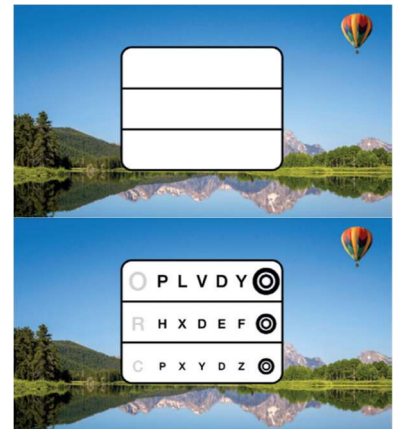
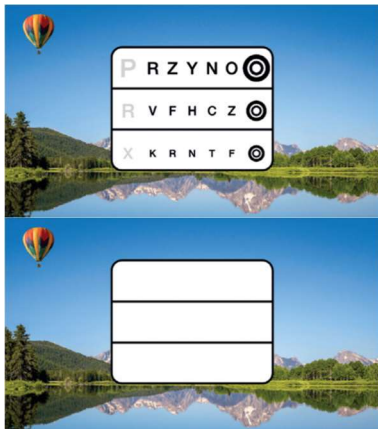
- If seen by pressing the inverse button twice: dog, cat, dog, → right eye dominant
- If seen cat, dog, cat → left eye dominant
- If seen a mixed creature → no clear dominant eye

Recommendation: write down the dominance!



## TEST 4

Sphere/Cylinder/Axis and Contrast Screening according to Bailey Lovie



Starting with the dominant eye, the known monocular refraction is performed. Sphere, cylinder axis and cylinder power. This is done under binocular conditions, as the untested eye sees the stereoscopic background and the optotype field without optotypes.



Change the optotype type by pressing this button.

Letters, numbers, Snellen E-hooks and Landolt rings can be selected.



Pressing the plus sign: The optotypes become larger.

Pressing the minus sign: The optotypes become smaller.

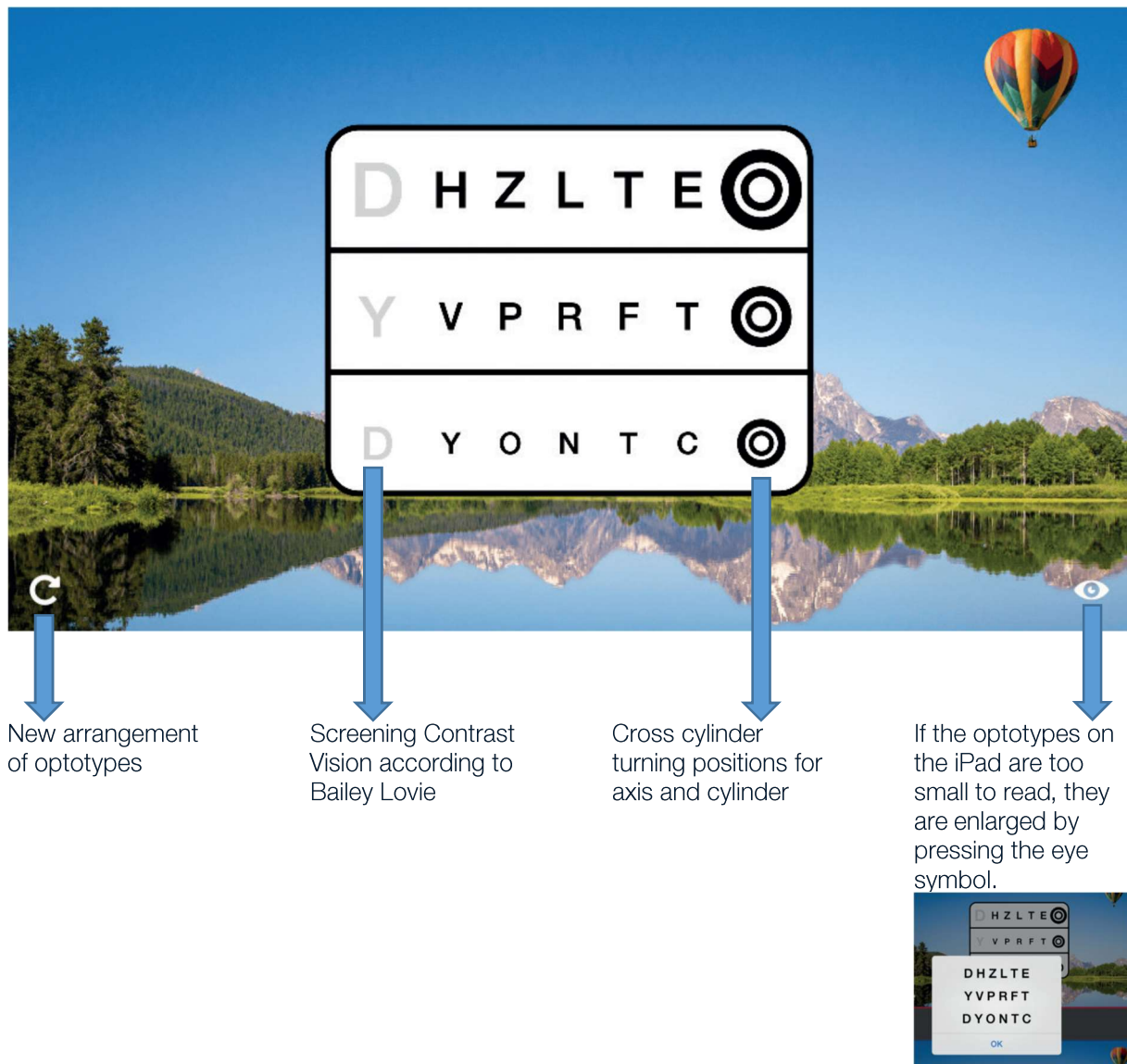
The size of the optotypes is shifted one row up and one row down. This test is limited to the smallest visual acuity level 0,32.

If larger optotypes are required, pressing the plus button opens the test for single line optotypes.



Change between the right and left eye. It is possible to switch between the eyes at any time during the test.





### Screening of contrast vision:

The optotypes are reduced to 20 % contrast and two visual acuity levels larger than the optotypes of the respective series. If these are detected, contrast vision is considered to be in accordance with the rules.

## TEST 5

PASKAL test for fine adjustment of powers



The optotype size may be different between R and L. The sizes from test 4 are taken.

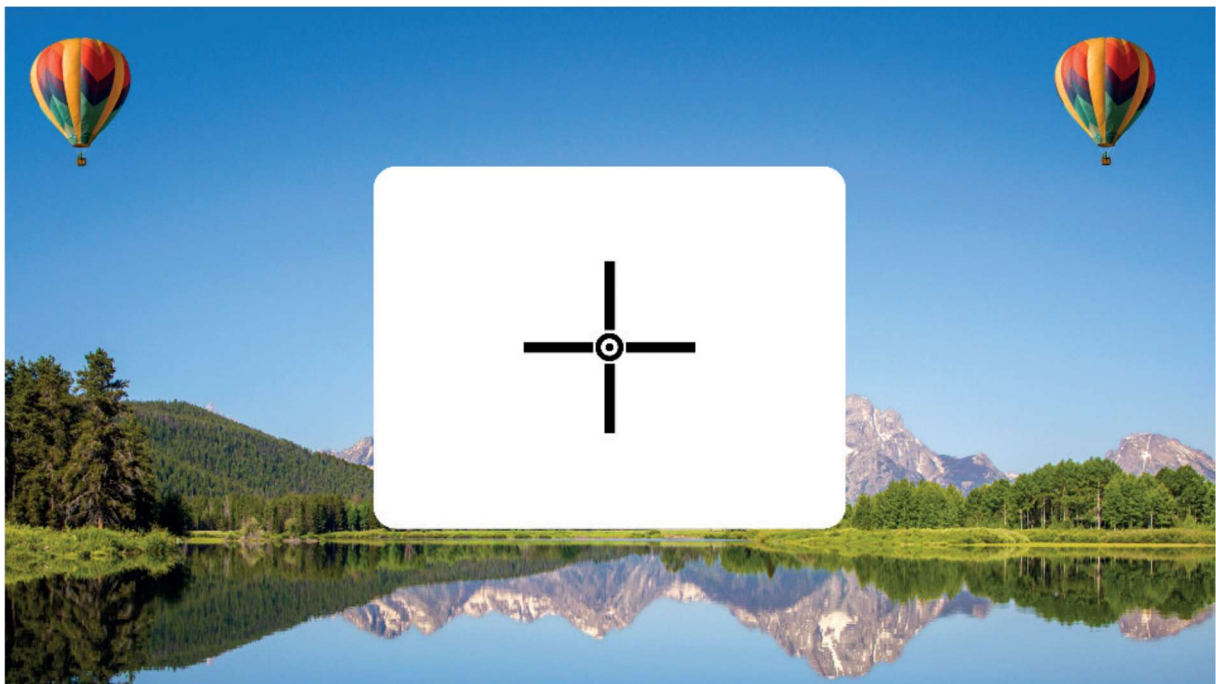
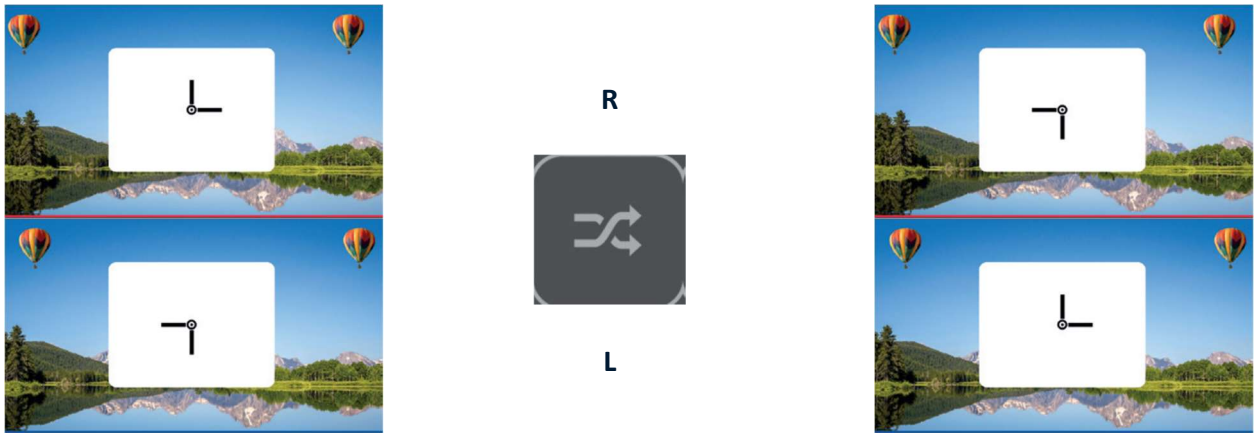
The optotype sizes for the right and left eye can be controlled by additional buttons.

Here the last fine adjustment for sphere (refraction equilibrium), cylinder axis and cylinder power is carried out. Test persons with a high visual acuity and good contrast vision react to 0.12 dpt sphere and cylinder.



## TEST 6

Grolman cross for phoria determination for associating prisms



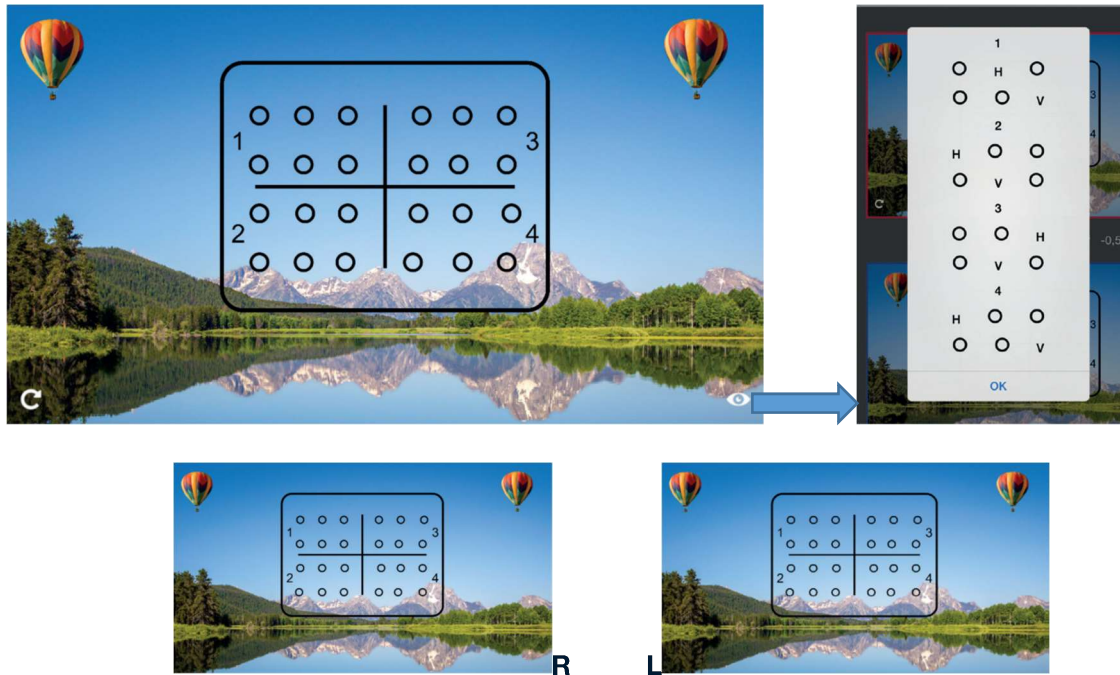
This test first gives an overview of the phoria status. By its central locking the motor part of the phoria is found, which releases a sensory fusion (associating prism). To determine esophorias or exophorias, the offset of the vertical lines is asked for. Upper line to the left "Exo" (Base inward) to the right "Eso" (Base outwards). The horizontal lines determine the height phoria.

The prismatic corrections found here are very well tolerated, lead to better stereoscopic vision and usually also to an improvement in visual acuity. You can switch to MKH or other phoretic tests at any time.

If a prism is given, the sphere and the cylinder should definitely be checked again with Test 5.

## TEST 7

Stereopsis test with graded parallax



**"This test consists of 4 fields. First look at field 4. There are two rows. In each row one ring comes out, one stands behind. Which ring comes out, which is behind?"**

Field 4 contains the largest parallax, field 1 the smallest. In the lower row this corresponds to a stereovisus of 1.0, in the upper row to 2.0.

With the inverse button the direction is changed forwards or backwards. It is possible to offer the stereopsis only to the front or only to the back.

## TEST 8

Binocular visual acuity test at the end of refraction



### Adjustment between space and distant correction

Determine highest visual acuity level.

Binocular with sph +0.25 dpt worse or paler or greyer?

Binocular with sph -0.25 dpt better or more strenuous or less pleasant?

## TESTPICTURES

At the end of the eyeglass determination, various 3D images are offered to demonstrate spatial vision as a visual experience.



[paskal3d.com](http://paskal3d.com)