

# Visual Skill Test Set

## Instruction Manual

# THE KEYSTONE VISUAL-SKILLS TEST

In the hands of the eye specialist these tests have significant diagnostic values in that they reveal losses of specific skills. They serve uniquely to demonstrate that a visual problem exists; to indicate the degree of elimination of that problem; to make clear to the patient that a visual problem exists and to convey to him/her what is meant by the term "visual achievement." The Keystone Visual-Skills Tests over a period of years have gained for themselves a distinctive place in the office of many doctors because they have been found by wide experience to evoke vital diagnostic data not obtained in any conventional examination.

## THE NATURE OF THE TESTS

The Keystone Visual-Skills Tests are essentially measurements of habitual responses, so designed that the stimulus situation demands no conscious effort because all findings are taken under equal excitation to accommodation and convergence. There are no unequal stresses set up by any stimulus situation, no demand to "hold" or "resist" anything. The patient is merely instructed to report what he/she sees. These tests show graphically the patterns of perceptual motor or responses. No other comparable diagnostic means are available to the profession.

## TABLE OF CONTENTS

### The Keystone Visual-Skills Tests

	Page
I. Simultaneous Perception.....	5
II. Hyperphoria.....	6
III. Lateral Phoria.....	6
IV. Binocular Coordination.....	7
V. Binocular Acuity, Usable Vision, Right Eye; Left Eye and Both Eyes..	8
VI. Stereopsis.....	9
VII. Color Perception, Detects severe color defects.....	9
VIII. Color Perception, Detect mild color defects.....	10

### At Near Point

IX. Lateral Phoria	10
X. Binocular Coordination	10
XI. Binocular Acuity.....	11
XII. Usable Vision, Right Eye	11
XIII. Usable Vision, Left Eye	11

## IMPORTANCE OF THE KEYSTONE VISUAL-SKILLS TESTS

It can be stated as a general proposition that, no matter what changes can be shown in the other case-study findings, so long as the visual skills are distorted the visual achievements remains lower than is satisfactory.

## THE SCOPE OF THE KEYSTONE VISUAL-SKILLS TESTS

### At Far Point

<b>Test 1</b>	<b>Simultaneous Perception-DB 10A</b> A gross suppression test.	<b>Test 8</b>	<b>Color Perception-DB 13A</b> Detects severe color defects.
<b>Test 2</b>	<b>Hyperphoria-DB 8C</b> A simple, reliable test for vertical imbalance.	<b>Test 9</b>	<b>Color Perception-DB 14A</b> Detects mild color defects "green".
<b>Test 3</b>	<b>Lateral Phoria-DB 9</b> A study of lateral posture and postural stability.		
<b>Test 4</b>	<b>Binocular Coordination-DB 4K</b> A study of fusion facility.		<b>At Near Point</b>
<b>Test 4 ½</b>	<b>Usable Vision Binocular DB-1D</b>	<b>Test 10</b>	<b>Lateral Phoria-DB 9B</b> Has the same significance as III.
<b>Test 5</b>	<b>Usable Vision-Right Eye-DB 3B</b> Determined without occlusion. Permits the measurements of Monocular discrimination under Fusion. <b>Maximum</b> acuity may be Determined under occlusion.	<b>Test 11</b>	<b>Binocular Coordination - DB 5K</b> Has the same significance as Test IV.
		<b>Test 12</b>	<b>Binocular Acuity-DB 15</b>
<b>Test 6</b>	<b>Usable Vision-Left Eye-DB 2B</b> Same significance as Test V.	<b>Test 13</b>	<b>Usable Vision-Right Eye-DB 16</b> Has the same significance as Test V
<b>Test 7</b>	<b>Stereopsis-DB 6D</b> A gross test for loss of depth Awareness.	<b>Test 14</b>	<b>Usable Vision-Left Eye-DB 17</b> Has the same significance as Test V.

O'Brian Central Field Tests  
Keystone Multi-Stereo Tests  
Spache Binocular Reading Tests  
Retinal Rivalry Test  
Paramacular Suppression Test  
Ready to Read  
Cyclophoria

Keystone Visual Survey, Short Test Unit  
Near Point Suppression Test  
Universal Driver Test  
Hand-Eye Coordination Test  
Keystone Test of Binocular Skill in Reading  
Mark Diplopia Field Tests  
Progress of Fusion

Many Others



## PROCEDURE FOR ADMINISTERING THE TESTS

The Telebinocular should be adjusted so as to give each eye a full view of its field. Care should be taken that no outside glare interferes with the tests.

It is best to place all stereotargets in the holder. This saves time and permits the control of exposures in the tests where the time element is a condition of the test, as in Test III and IV.

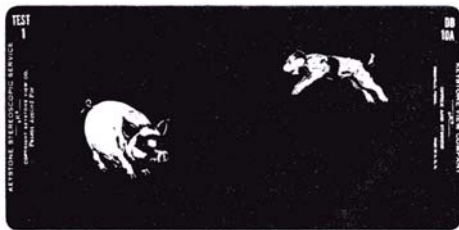
Seat the subject at the instrument and near enough to it so that his/her back and head are erect, shoulders level but relaxed, and feet flat on the floor or comfortably placed on the rung of the stool or chair.

The instrument is then adjusted to the required height to maintain the desired body posture. Comfortable and correct posture is essential-first, because general body posture is also concerned with seeing; second, because uncomfortable posture will distract the subject's attention from the test. After correct posture has been **attained**, it is to be **maintained** during the entire testing period.

If bifocals are worn, it will be necessary to adjust the instrument and glasses so that the subject's line of vision may pass unobstructed through the bottom of his/her bifocal segment for the near-point tests, or the amount of the add may be inserted in the lens wells.

### Questions

#### Test 1-SIMULTANEOUS PERCEPTION-At $\infty$ , FAR POINT



DB 10A

“What do you see?”

or

“Do you see dog?” “And a pig?”

(Pointing to each.) “Is the dog directly over the pig?”

If a small child seems afraid of the Telebinocular at first, introduce the test by asking:

“Do you know about the little pig that went to the market?”

### Instructions and Interpretation

The sole purpose of Test I is to determine whether both eyes see at the same time.

If simultaneous perception is not present, only Test V and VI can be given.

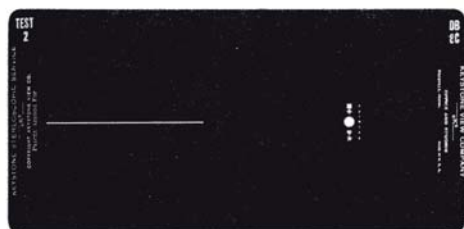
If the dog and the pig are seen alternately, alternate suppression is indicated.

If only the dog, or the pig, can be seen, except by occluding the dominate eye, gross suppression is present.

If the dog, or the pig, cannot be seen when the other eye is occluded, blindness or high amblyopia exists.

Small children may be asked to point to the pig on the **right** side or to the dog on the **left** side, to verify that they are seeing both at the same time.

## TEST II-HYPERPHORIA-AT $\infty$ , FAR POINT



DB 8C

“Do you see a yellow line and the red figures?” (Pointing.) “What figure does the yellow line touch?”

The head should be level in the Telebinocular at all times. If hyperphoria is reported with Rx, repeat test without Rx; the frame may be bent. (This test may well be used when adjusting glasses, especially in the case of strong corrections.)

When the yellow line passes anywhere within the ball and the zero, mark “EXPECTED.” When the line passes through the cross, the reading is two diopters of **right** hyperphoria. When the line passes through the star, the reading is three diopters of **left** hyperphoria.

If the yellow line fails to become stabilized and continues to move up and down, mark the limits of the swing. A variable hyperphoria has diagnostic significance.

Answers may be verified by having the patient report when your pointer, held before the **right** eye, touches the yellow line.

The fading of the yellow line at the point where it crosses a red figure has no diagnostic significance. The phenomenon is probably due to retinal rivalry.

## TEST III-LATERAL PHORIA-AT $\infty$ , FAR POINT



DB 9

The patient is to report:

1. To what number the arrow points at the instant the target is exposed by the quick removal of the stereogram in front of it.
2. Whether the arrow remains under the initial number.
3. Whether the arrow moves quickly under some other number and remains there.

“To what number does the arrow point?”

- Whether the arrow swings, pendulum-like, between certain numbers for a time, but eventually becomes stationary.
- Whether the arrow continues to swing.

If the arrow stands definitely at any point, recording should be made accordingly.

In many cases the apparent movement of the arrow will delay a response. To assist in speeding a response, ask for a number within the range of movement. When this has been obtained, it can be ascertained how far each way the movement continues.

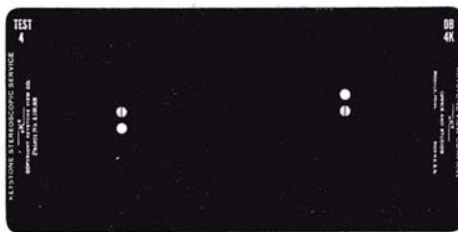
If the movement continues in one direction, recording should not be made until a movement in that direction has stopped. Recording may be made thus: 1---->---1.

Findings falling to the **left** of the “EXPECTED” column indicate exophoria; to the **right**, esophoria.

The posture of the visual axes at the instant of exposure is indicative of their “readiness” to collaborate in the binocular act, and of the speed and efficiency of seeing.

Marked deviations from parallelism or postural instability denote unbalanced accommodative-convergence relationship.

## TEST IV-BINOCULAR COORDINATION-AT $\infty$ , FAR POINT



DB 4K

“How many balls do you see?”  
or

“Do you see two, three, or four balls?”

- The target should be exposed **quickly**.
- The patient should report how many balls are seen **immediately** upon exposure. There may be:
  - Three**, remaining three and in postural **vertical** alignment. Shows that the eyes are postured habitually for single binocular vision, indicating fusion “readiness.”
  - Three**, remaining three, but in **oblique** alignment. Usually associated with a high phoria. Indicates fusion is maintained with effort.
  - Four**, becoming three **instantly**. Has practically the same significance as **a**.
  - Four**, becoming three **slowly**.

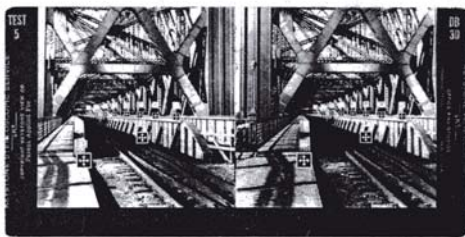


Indicates that the eyes are not automatically positioned for fusion, with consequent lowering of performance. Check in Doubtful column.

- e. **Four**, remaining four. Show marked interference in accommodative-convergence relationship. Look for macular, perimacular, and peripheral cancellation-suppression. See "Supplementary Tests."
- f. **Two** balls. Show gross suppression. Look for amblyopia and squint.

This Test may be considered a recovery at Orthophoria Test. If the Lateral Phoria is not close to Orthophoria, the patient who sees four balls is indicating that positive or negative fusional convergence is weak.

## TEST 4 ½, 5 AND 6.-USABLE VISION, BINOCULAR, RIGHT EYE AND LEFT EYE



DB — 3D Right Eye  
DB — 2D Left Eye  
DB — 1D Binocular

"You see some signboards. In No.1 (pointing) you see five white squares. And in one of these squares is a black dot. Is it in the right, left, top, bottom, or center square?" "Where is it in the other signs?" (Use pointer.)

It will be noticed that referential background is identical for both eyes, but the test target, a black dot, appears only before the eye under test. This arrangement makes it possible to measure the visual response of one eye while binocular vision is maintained, as under normal working conditions. The percentage of vision demonstrated under the conditions of the test will be referred to as "Usable Vision." When usable vision falls materially below 100%, a monocular test of that eye should be made. (A blank card may be held in front of the Telebinocular tube.) Record usable and monocular scores by distinguishing symbols, such as  $\sqrt{\quad}$  for usable and a circle for monocular. (See Cumulative Record Form No.2.)

**Responses should be prompt. If the subject hesitates, indicating an effort to guess, the last previous response should be checked as final.**

The elimination of letter targets avoids the factor of recognition of familiar contours, present in the use of the Snellen Chart. The usable vision score cannot be

correlated with the findings of the standard Snellen test. While the Snellen type of test measures the maximum of monocular acuity under occlusion, the usable vision test scores the **habitual** performance of each eye under fusion. The usable vision test does not necessarily elicit maximum acuity; rather, the purpose of the test is to determine whether there has been any functional loss of vision. When the response under association is lower than the monocular finding (under occlusion), the impairment may be attributed to central suppression and signifies that a visual problem exists. It is generally accepted that the earliest skills loss occurs in the central field. Here, then, the first sign of interference between patterns is to be looked for. Consequently, Tests V and VI assume major diagnostic significance in the investigation of visual problems.

The findings secured in the usable vision test may properly be subjected to further specific evaluation. Suppose a not uncommon occurrence: a patient, doing a great deal of reading, cannot go beyond No.6 target, but when the other eye is occluded No.9 target is readily located. The difference in monocular and binocular performance levels can be accounted for only on the hypothesis that when the demand is better than 20/60-vision binocularity cannot be maintained in the central field. Since much reading matter requires visual acuity about 20/60, the response signifies inadequate adaptation to the given task. This is to say, the acuity level at which suppression occurs may give information as to the nature and the extent of the existing problem.

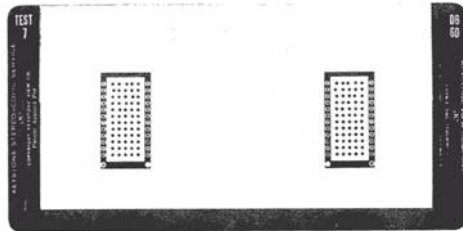
The procedure is excellent for demonstrating to the patient the nature of his/her difficulty. Personal appreciation of his/her problem is necessary to obtain his/her full cooperation for whatever correction program is necessary.

The conventional examination includes no equivalent test for detecting the subtle concessions made to maintain clear, single and efficient vision.

NOTE: Snellen equivalents on Tests V and VI are valid only when one eye is occluded:

50%	70%	84%	88%	92%	96%	98%	100%	103%	105%
20/100	20/60	20/40	20/32	20/28	20/25	20/22	20/20	20/17	20/15

## TEST VII-STEREOPSIS-AT $\infty$ , FAR POINT



DB 6D

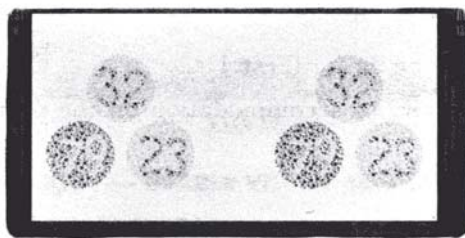
“You see (pointing to each figure in the top line) a star, -square-cross,-heart and ball. Does one of them seem to be closer to you than the rest? Which one in the second line?” etc.

When visual problem arises, binocular foveal fixation is the first skill to be suppressed. (See Test V.) Since refined space judgment is based on binocular foveal fixation stereoscopic awareness also suffers loss at any early date. Deterioration of depth discrimination becomes corroborative evidence of central depression.

DB 6D is a screen-out test. Failure on any part of this test signifies need of corrective attention. When a more critical test is desired, as a criterion for progress examinations or where exact information is needed, use Stereometric Units DC1-23, or DC31-53 or the Keystone Multi-Stereo Tests.

Be sure that the patient understands what he/she is to look for. Instructions should be given slowly and clearly. Sometimes it is necessary to point out the correct character in the top line before he/she understands what is wanted.

## TEST VIII-COLOR PERCEPTION TEST (FOR SEVERE DEFECTS)-AT $\infty$ , FAR POINT



DB 13A

Do not permit the patient to study the target or delay too long.

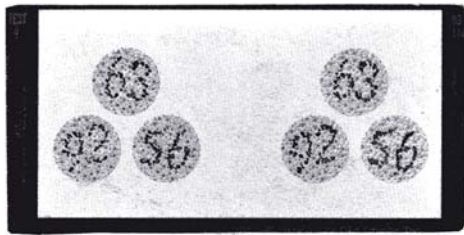
Score by checking correct readings on the record form. Two balls, both digits, correctly read are passing. Two balls, both digits, incorrectly read indicate failure and mild red-green color blindness.

Read the number (pointing) in the top ball.

Read the number (pointing) in the lower left ball.

Read the number (pointing) in the lower right ball.

## TEST IX-COLOR PERCEPTION (FOR MILD DEFECTS)-AT ∞, FAR POINT



DB 14A

Do not permit the patient to study the target or delay too long.

Score by checking correct readings on the record form. Two balls, both digits, correctly read are passing. Two balls, both digits, incorrectly read indicate failure and mild red-green color blindness.

Read the number (pointing) in the top ball.

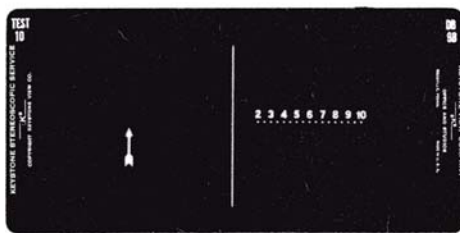
Read the number (pointing) in the lower left ball.

Read the number (pointing) in the lower right ball.

## NEAR-POINT TESTS

It is generally accepted that fatigue is caused by prolonged concentration within a restriction area. The responses evoked in the following near-point tests becomes, therefore, especially informative when the chief use of the eyes is at close range.

## TEST X-LATERAL PHORIA-AT 2.50, NEAR POINT



DB 9B

Procedure and interpretation same as for Test III. Indicates the effect of 2.50 diopters of accommodation on the position of the visual axes.

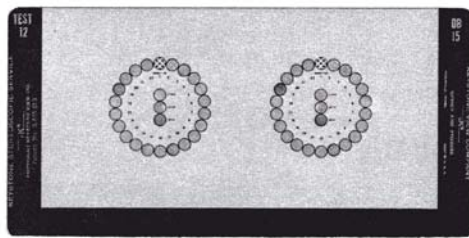
## TEST XI-BINOCULAR COORDINATION-AT 2.50, NEAR POINT



DB 5K

Procedure and interpretation same as for Test IV.

## TEST XII-BINOCULAR ACUITY-AT 2.50, NEAR POINT



DB 15

“On these balls (pointing to each in center) you see **lines**, **dots**, or **gray**. Which of these patterns do you see, starting with No.1 (pointing)?”

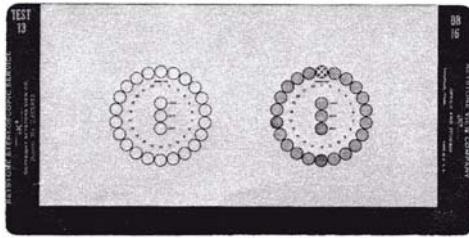
It is well to tell the patient that patterns on the balls 1, 2, and 3 in this manner. “Ball 1 has black dot; Ball 2 has black dots; Ball 3 has black lines.”

The conditions of this test are the same as in Test V; that is to say, the Usable Vision of each eye can be determined while fusion is maintained. The interpretations pertinent to Test V are valid here. The general observations at the head of the Near Point section should be noted, because suppression of central fixation at the working distance may be more directly significant of the existing visual problem.

Do not hurry the subject, but at the same time do not give him/her too much time for study or allow him/her to guess. When a ball is miscalled and obviously not seen clearly, or when guessing is obvious, check on the record form at this point.

NOTE: In dealing with children it is well to allow them to proceed beyond the point where they miss one ball. Do not stop the child on his/her first miscalled ball. If he/she can go on and give additional correct responses, let him/her proceed until he/she makes two mistakes successively. Then say, “Tell me again what you saw on Ball 6 (Miscalled).” Often it will be found that the child simply made a mistake in reporting on the first miscalled ball.

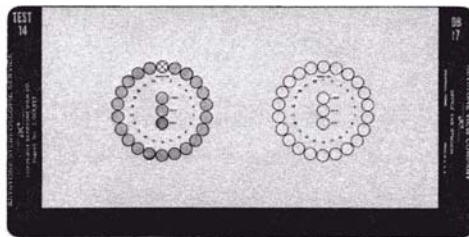
## TEST XIII-USABLE VISION, RIGHT EYE-AT 2.50, NEAR POINT



**DB 16**

Procedure is same as in Test XII.

## TEST XIV-USABLE VISION, LEFT EYE-AT 2.50, NEAR POINT



**DB 17**

Procedure is same as for right eye.

### SNELLEN EQUIVALENTS:

NOTE: Snellen equivalents on Test 12, 13, and 14 are valid only when one eye is occluded:

10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
20/200	20/100	20/67	20/50	20/40	20/33	20/28	20/25	20/22	20/20
102%	103%	105%							
20/18	20/17	20/15							

