
# Easyfield

## Instruction Manual

Copyright by

OCULUS

G/56930/0402/e

# 0 Foreword

Thank you for the confidence which you have placed in us by selecting this OCULUS product.

The OCULUS Ophthalmic Company has a long and proud tradition. For more than 100 years, it has been our goal to produce modern, innovative products which lighten your workload in the routine of daily practice.

We cooperate with many clinics and practicing physicians and develop performance specifications for new instruments in close consultation with them.

This Instruction Manual will help you to familiarize yourself quickly with your new unit.

We wish you good results with your new EASYFIELD perimeter and continued success in your work.

Should you ever have a problem with this unit, please contact your OCULUS representative or get in touch with OCULUS directly. We will be glad to help you in any way possible.

Your OCULUS Team

OCULUS has been certified since 1996 in accordance with ISO Norm No. 9001, EN Norm No. 46001, and Medical Device Directive 93/42/EEC. What this means for you is that our company sets a high standard for the development, production, quality and service of our entire range of products.

# 1 Table of Contents

## 2 Standard Equipment and Optional Accessories

**Standard Equipment:**

**Order No. 56930**

OCULUS-EASYFIELD Perimeter

EASYFIELD Control unit
Downloadcable
Backup-Software

Dust cover

Table-top power supply unit

Main cable

Eye occluder

Patient's response button

Lens mount for full aperture corrective lenses

Instruction manual

Test certificate electrical safety

Interface-cable

**Order No. 56932**

OCULUS-EASYFIELD Perimeter

Dust cover

Table-top power supply unit

Main cable

Eye occluder

Patient's response button

Lens mount for full aperture corrective lenses

Instruction manual

Setup-Disk with Software

Test certificate electrical safety

Interface-cable

**Optional Accessories:**

| | |
|---|---|
| Thermo-paper for control unit (Length 25m, Width 57mm, ∅-plastic tube 12mm) | 65311 |
| Carrying case: | 56936 |
| Correction Lenses, small set, 12pcs. (±6D / ±4D / ±3D / ±2D / ±1D / ±0.5D) | 55903 |

We reserve the right to change standard equipment as required by technical progress.

# 3 Safety Precautions

The manufacturer is required by law to inform the user explicitly about safety aspects involved in dealing with this unit. This chapter contains a summary of the most important information which is to be noted regarding these points of technical safety.

Other safety precautions are found in the text of this Instruction Manual and are marked with the following symbol:

Please give these remarks your special attention.

Store this Instruction Manual with care in a place where it is accessible at all times for persons using the unit; also, give due attention to the instruction manuals of the unit's other accessories as required.

The unit may only be used for its intended purpose, as described in Chapter 5 of this Instruction Manual, and by persons whose proper use of the unit is ensured by their training and practical experience.

Use the unit only with original parts and accessories delivered by us and in a technically flawless condition. Do not attempt to use the unit if it becomes damaged, but contact your supplier.

Please abide by accident prevention laws where applicable and pay special heed to the printed instructions and information on the unit itself.

The unit may be used in medical areas only if these rooms are equipped according to VDE 0107 norms or the equivalent (Association of German Electrotechnical Engineers).

Always disconnect all main plugs from their power outlets before carrying out maintenance or cleaning work.

Disconnect the main plug at once if you notice smoke, sparks, or unusual sounds coming from the unit. Do not use the unit again until the problem has been corrected by our service personnel.

Do not connect electrical plugs and sockets by main force. If it is not possible to connect them, verify whether the plug is correct for the socket. If you find damage in either the plug or the socket, have them repaired by our service personnel.

Do not disconnect electric plugs from their sockets by pulling on the cable, but rather on the plug.

Additional equipment which is connected to the analog or digital interfaces of the unit must have been shown to meet European Union norms or IEC specifications. Moreover, all configurations must meet the requirements of IEC Systems Norm No. 601-1.

Under no circumstances may integrated electric medical systems be created by coupling the EASYFIELD Perimeter to non-medical electric devices (e.g. data processing equipment) in such a way that patient safety is below that required by IEC Norm No. 601-1. A safety disconnection device must be provided if it is possible that such a coupling might lead to higher leakage current values than those which are permissible.

Do not use the equipment named in the Standard Equipment List in situations:

- Where there is danger of explosion.
- Where flammable anesthetics or volatile solvents such as alcohol, benzene or the like are present.

Do not store or use the unit in damp rooms. Avoid placing the unit near dripping, gushing, or splashing water, and make certain that no fluid can enter the unit. For this reason, please do not place any containers full of liquid on or near the unit.
Take care when cleaning the unit with a damp cloth that no fluid gets into the unit.

This unit is a high-quality technical product. To ensure that it performs flawlessly and safely, we recommend having the unit inspected regularly every two years by our

service personnel.
Should any problem arise which you cannot solve using the enclosed checklist of errors (see 9.4, page 57), label the unit "Out of Order" and contact our service department.

# 4 Description of Unit

## 4.1 Technical Features of the Unit

The EASYFIELD back-lighted projection perimeter offers static, automatic visual field examinations. It fulfils the requirements of ISO Norm No. 12866. It uses a cupola with a virtual radius of 30 cm, corresponding to the Goldmann standard. This bowl is homogeneously illuminated (luminance is calibrated to 10 cd/$m^2$). The unit is computer-controlled, and linkup takes place only via the serial interface.

## 4.2 Warning Signs and Instructions on the Unit

**Please read the accompanying instructions!**

**Type B applied part**

## 5 Appropriate Use of the Unit

This unit may be used only for the purposes described in this Instruction Manual. It is designed for tests of the visual field of the human eye.

The unit may be used only by persons whose proper use of the unit is ensured by their training and practical experience.

Use the unit only with original parts and accessories delivered by us and in a technically flawless condition.

With the computer controlling the EASYFIELD Perimeter, it is not permitted to run other software parallel to the examination software in the foreground (such as screen saver, user programs, etc.)

Modes to save energy (BIOS or Windows) should be deactivated.

Do not carry the control unit by holding it at the blue cover. The blue cover is not permanently fixed as it must be removed to add new printer paper. If the control unit is held by the blue cover, the control unit may accidentally detach from the blue cover and fall off.

Use the unit only with an electric supply system whose supply voltage is within the range given on the specification plate.

Please take care to observe the safety precautions given above.

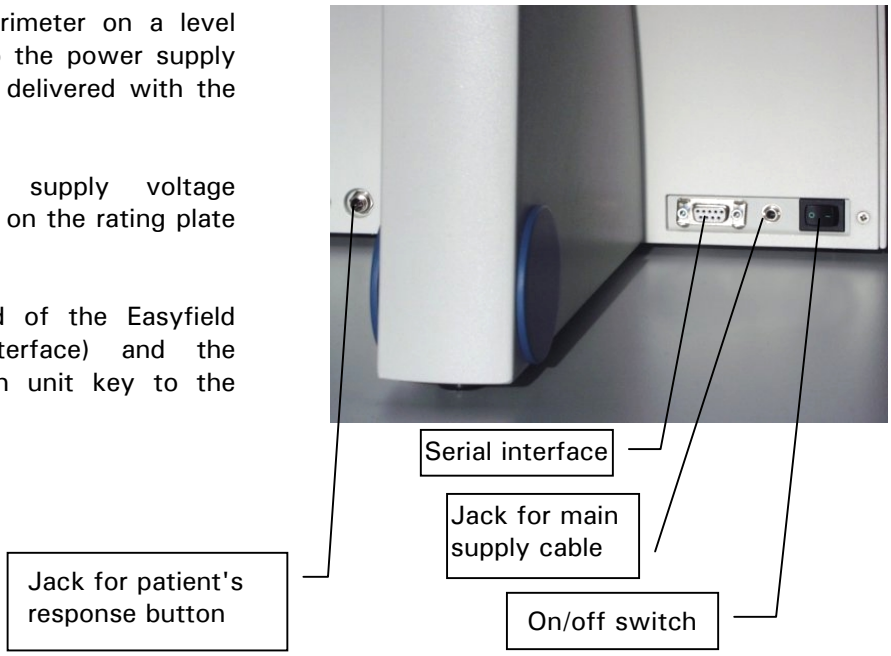
# 6 First Use of the Unit

## 6.1 Preparing for First Use

Place the EASYFIELD perimeter on a level surface and connect it to the power supply using the electrical cable delivered with the unit.

Make sure that the supply voltage corresponds to that given on the rating plate of the power supply.

Connect the supply lead of the Easyfield control unit (serial interface) and the patient's response button unit key to the back of the Easyfield.




## 6.2 Instructions on Transportation and Storage

Please use the original packing materials when transporting the unit. This will enable you to avoid unnecessary damage and costs.

Avoid unnecessary impacts when transporting the unit to another location. Such impacts may negatively affect the optical and electronic components and the calibration of the unit.

Always check the unit for damage after it has been moved to a new location. Do not use the unit under any circumstances if it has been damaged. In this case, please get in touch with our service department.

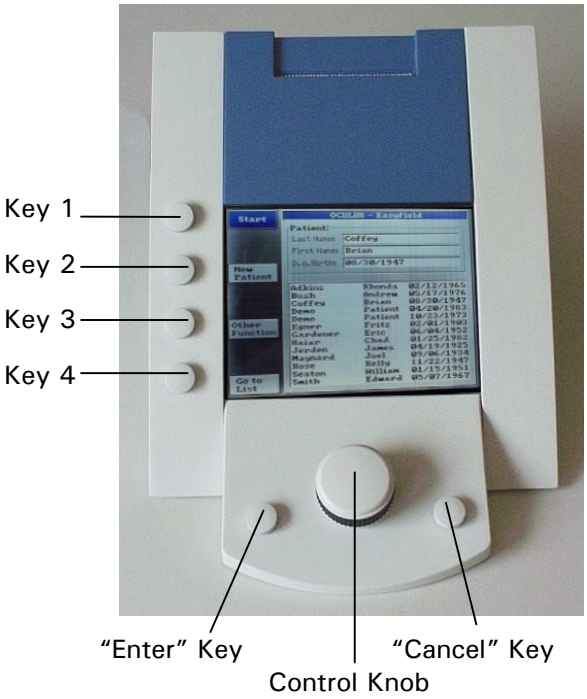
If you keep the unit in an automobile during the cold season of the year, its optical components may become fogged with condensation after being brought into much warmer surroundings.
Please give the unit time to adjust to the new surroundings before turning it on.

The conditions prescribed for transportation and storage by IEC Norm 601-1 are:

- Ambient temperature: -40°C ... +70°C (-40°F ... 158°F)
- Relative humidity: 10%...100% including condensation
- Air pressure: 500 hPa...1060 hPa (7,3 psi ... 15,3 psi)

These values apply for a period of 15 weeks at most when the unit is stored in its original packing material.

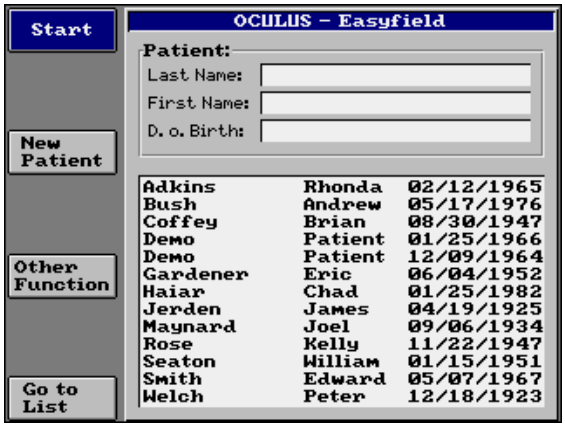
# 7 Using the Control Unit




The Easyfield control unit has six push buttons and a control knob. Four push buttons are located at the side of the monitor, and their functions are indicated there. These functions vary during the course of the program.
Underneath the screen you will see the control knob and two other push buttons. The control knob is used to alternate between the different elements (i.e. functions) of the software. The element which is active at the moment is always highlighted or framed in blue.
The push button at the left of the control knob always has the function "Enter" or "Apply", i.e. implements choices which you have made. - The right push button has the function "Cancel" or "Back".

**Note:** The right push button has no function in many situations. This is deliberately planned in order to avoid inadvertent deletions during the entry of complex information. In such situations, "Cancel" is allocated to one of the push buttons at the side.

After the unit being turned on, the patient data management system is now been started. The following window appears on the screen:



## 7.1 Patient Data Management

### 7.1.1 Patient Selection

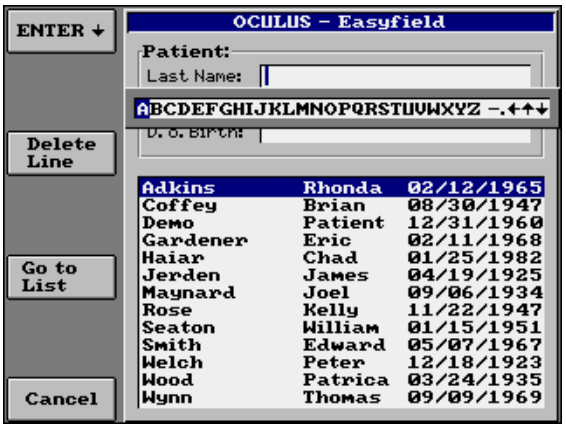
All patients examined in the past are now listed alphabetically on the lower right of the screen.

In order to select a patient whose data is already stored, press the push button with the **[Go to List]** function. The first name in the patient list is now highlighted in blue. Using the control knob, you can now navigate within the list of patients. If the desired patient is highlighted in blue, press the "Start" button. This brings you directly to the examination program.

If several patients have the same name, the search can be narrowed by entering the first few letters of the last name. To do so, press the "New Patient" button. As each new letter is selected, the program moves to the name in the patient list which best matches your input. Now press "**Go to List**", in order to find this information in the list, and then proceed as described above.

### 7.1.2 How to Enter a New Patient

In order to add a new patient to the patient data management system press the **[New Patient]** button.




Now input the patient's last name by selecting the letters in the name with the control knob and confirming each one with the "Enter" button.
Upper and lower case letters are automatically corrected by the program. In order to delete an erroneous character, select either **"←"** or the "**Cancel**" button.
Use the symbols **"↑"** and **"↓"** to move to the next line above or below.

After the last name has been completely entered, press **"ENTER ↓"**

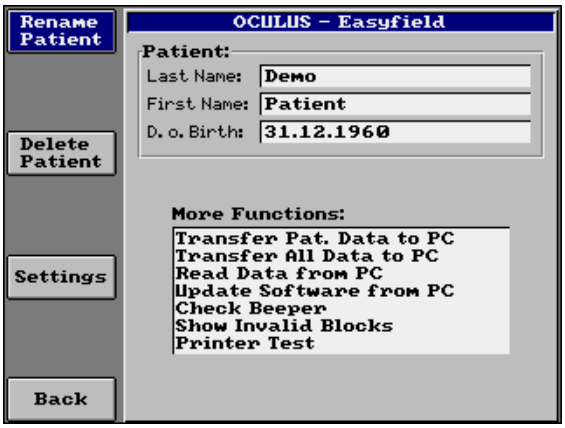
Now proceed in the same manner with the first name and the date of birth. Be sure to enter the date of birth in the format that is set in **"Other Functions**" / **"Settings**" / **"Date Format**". e.g.:12/31/1960

Possible formats for "MDY" + "/":
12/31/1960 → 12/31/1960
12/31/60 → 12/31/1960
123160 → 12/31/1960 (6 digit)
1960 → 01/01/1960 (4 digit)
60 → 01/01/1960 (2 digit)

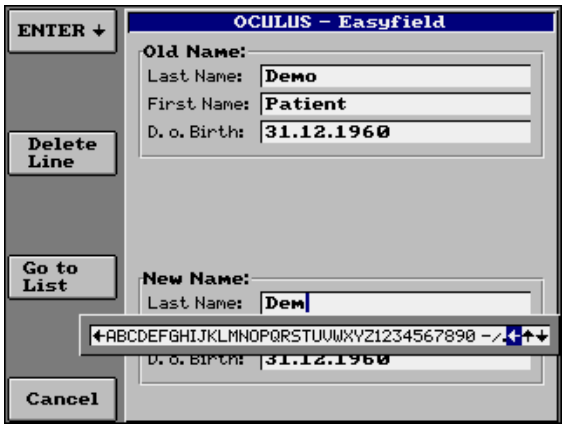
Usually the 6 digit format should be used to enter the date of birth.

### 7.1.3 How to Rename Patient Data

Select the patient whose name is to be changed. Now select "Other Functions" and then "Rename Patient".




Now proceed by entering the name as described above in section (see 7.1.2, page 12).

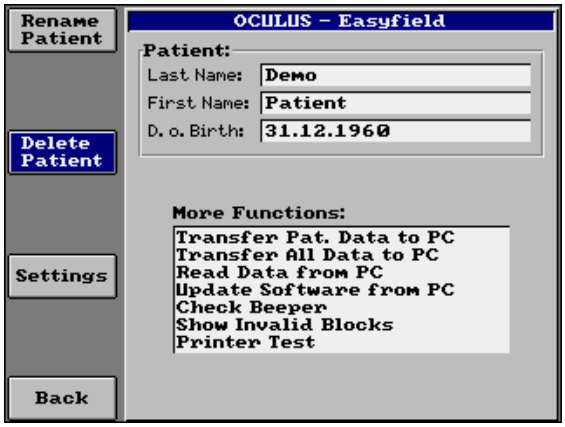



### 7.1.4 How to Delete Patient Data

Select the patient whose data is to be deleted and then the "**Other Functions**" button.

Now press "**Delete Patient**".

**Remember that the data are irretrievably lost after deletion.**



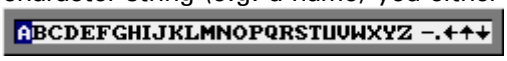
## 7.1.5 Settings

Specific settings of the program (Keyboard, date format, LCD brightness, clock time) can be changed under "**Other Functions**" and "**Settings**".

To reset one of these items, select it with the control knob and confirm your selection with the "Enter" button. "Language" and "Date Format" are selected directly.

The content of the text boxes must be selected with the help of the control knob first (T1). If the “Enter” key is then pressed the text box changes to select mode (T2), and the content can be changed by turning the control knob (T3). Use the "Enter" button to confirm your selection (T4), or the “Cancel” button to reload the old content (T1).

By making a choice in the “Keyboard” selection field you determine the content of the character input field throughout the program. Whenever you are asked to enter a character string (e.g. a name) you either see



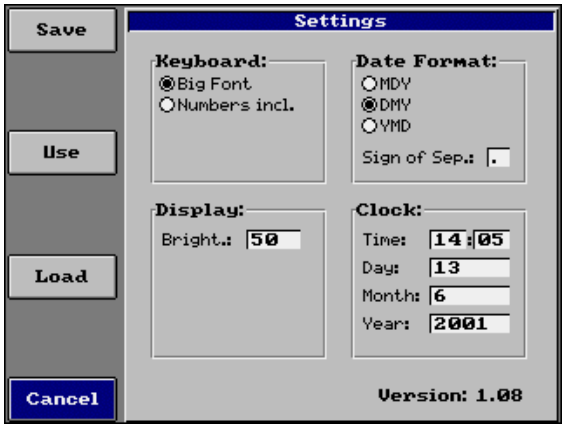

for “Big Font” or


for “Numbers included”

Selecting “Big Font”, gives you a shorter line of characters, enabling you to enter names more quickly, whereas selecting “Numbers incl.” gives you the option of entering ID numbers instead of patient surnames.

The setting of date format defines, how the patient’s date of birth must be entered:
MDY: Month/Day/Year e.g.:12/31/2000
DMY: Day/Month/Year e.g.:31/12/2000
YMD: Year/Month/Day e.g.:2000/12/31

The sign of separation defines also the date format:
/ : e.g.:12/31/2000
. : e.g.:12.31.2000
- : e.g.:12-31-2000





(T1) (T2) (T3) (T4)

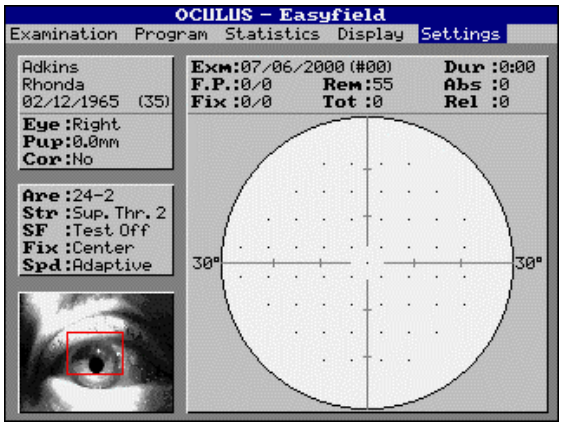
This windows does also show the version number of the software.

## 7.2 The Examination Program

In order to start the examination program, select a patient from the patient list and then press the **[Start]** button.

### 7.2.1 The Menu Bar of the Examination Program

After the **"OCULUS Easyfield"** examination program is started, the patient data system and pre-selected examination parameters are displayed. The following window appears on the screen:




The following main menu items are found in the main menu bar:

- **Examination**
  Used to run an examination, to load already stored examination results, to print out the latest results and to exit from the examination program with the menu item **"New Patient"** (= return to the patient data management).

- **Program**
  Use this function to select and manage pre-defined programs in order to ensure that examinations can be started as quickly as possible (see 7.2.4.6, page 28).

- **Statistics**
  Comparison and statistical evaluation (see 7.2.8, page 32).

- **Display**
  The following display modes are available: standard, relative, grey-scale, probability, 3D, and sectional profile (see 7.2.7, page 30).

- **Settings**
  Here it is possible to select user-specific settings (brightness of camera and display, print format) (see 7.2.9, page 34) and to carry out a function test of the response button.

### 7.2.2 Examination Parameters

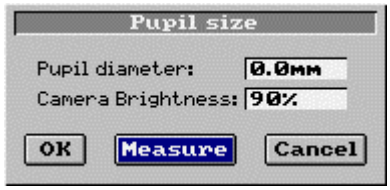
You can also adjust the examination parameters individually by selecting the parameter of your choice with the control knob and push the “Enter” button.
The following parameters can be changed:

#### 7.2.2.1 Eye

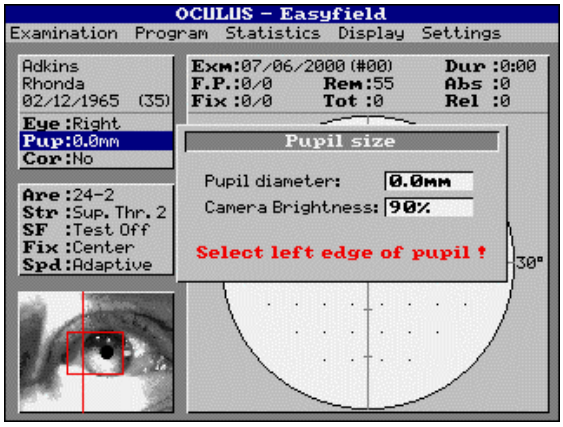
Used to designate the eye which is to be examined.


#### 7.2.2.2 Pupil (Pup)

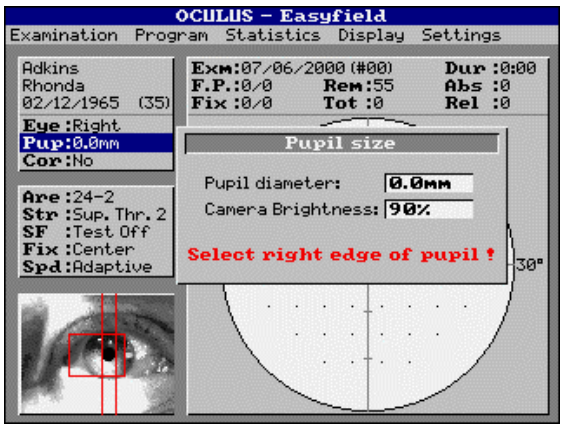
Here adjust the individual pupil diameter manually, or use the camera image to measure it. If necessary the camera brightness can also be changed here, in order to improve the image quality.




To do so, click the box “Measure”, move the red line to the left edge of the pupil and confirm this position.




Proceed the same way with the right edge of the pupil.



### 7.2.2.3 Correction (Cor)

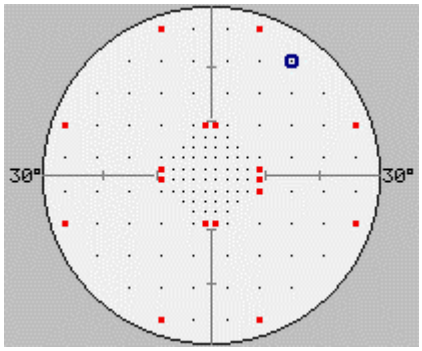
Used to enter a correction lens value which will be used during the examination.


### 7.2.2.4 Area (Are)

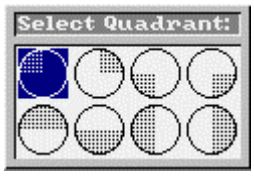
The "area" grid which is selected determines the specific locations at which individual measurements are carried out. The area grids available for selection are:

- **10-2**
  A rectangular grid with 61 test points from 0°-10°.
- **24-2**
  A rectangular grid with 55 test points from 0°-24° (incl. nasal step).
- **30-2**
  A rectangular grid with 77 test points from 0°-30°.
- **Single Points**
  This field is used to select any desired number from all available points.
  Now you can move around the grid by using the control knob. Press the "Enter" button in order to select or to delete a point. Each selected point is marked with a red square.

  The fourth button on the left side deletes all points.
  Use the "Back" button (right button) to conclude your input of individual points.

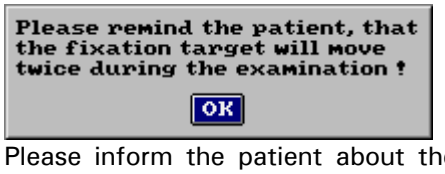



- **Quadrant**
  Here you can select the quadrants to be examined or the visual field half.




If the central grid is used (10-2 or selected with Single Points), the examination will be done with fixation displacement, so the examination will be done in 3 phases: Center fixation, upper fixation, lower fixation.
After finishing one phase the current fixation will be switched off, the next fixation will be switched on, and the examination continues after a short pause.

Before the examination starts the following message appears:




Please inform the patient about the fixation displacement.

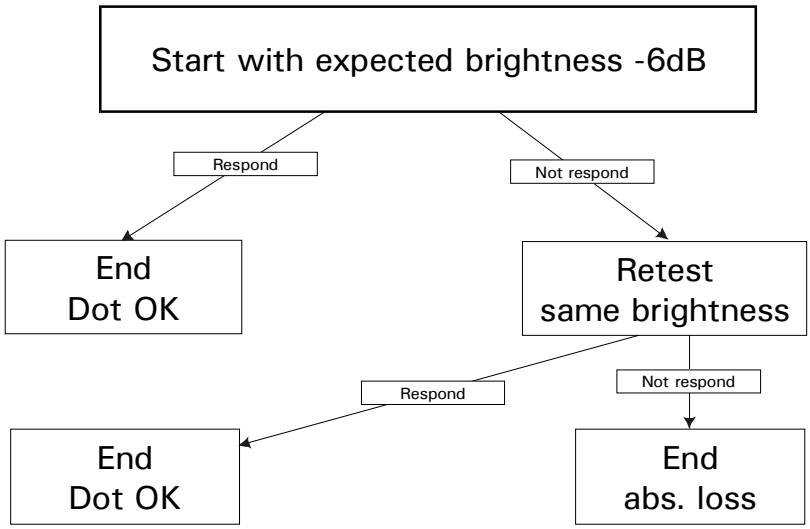
### 7.2.2.5 Strategy (Str)

The test point grid (area) is only one of the legs on which perimetry stands; it merely preselects locations at which the patient's luminance difference sensitivity (LDS) is to be determined. Truly informative perimetric findings are achieved only by presenting test stimuli of different brightness in order to derive conclusions about the threshold of luminance difference sensitivity at each grid location. This procedure is called the "examination strategy".
The EASYFIELD possesses five examination strategies, each of which can be used with each area (or grid).

#### 7.2.2.5.1 Supra Threshold 2-zone

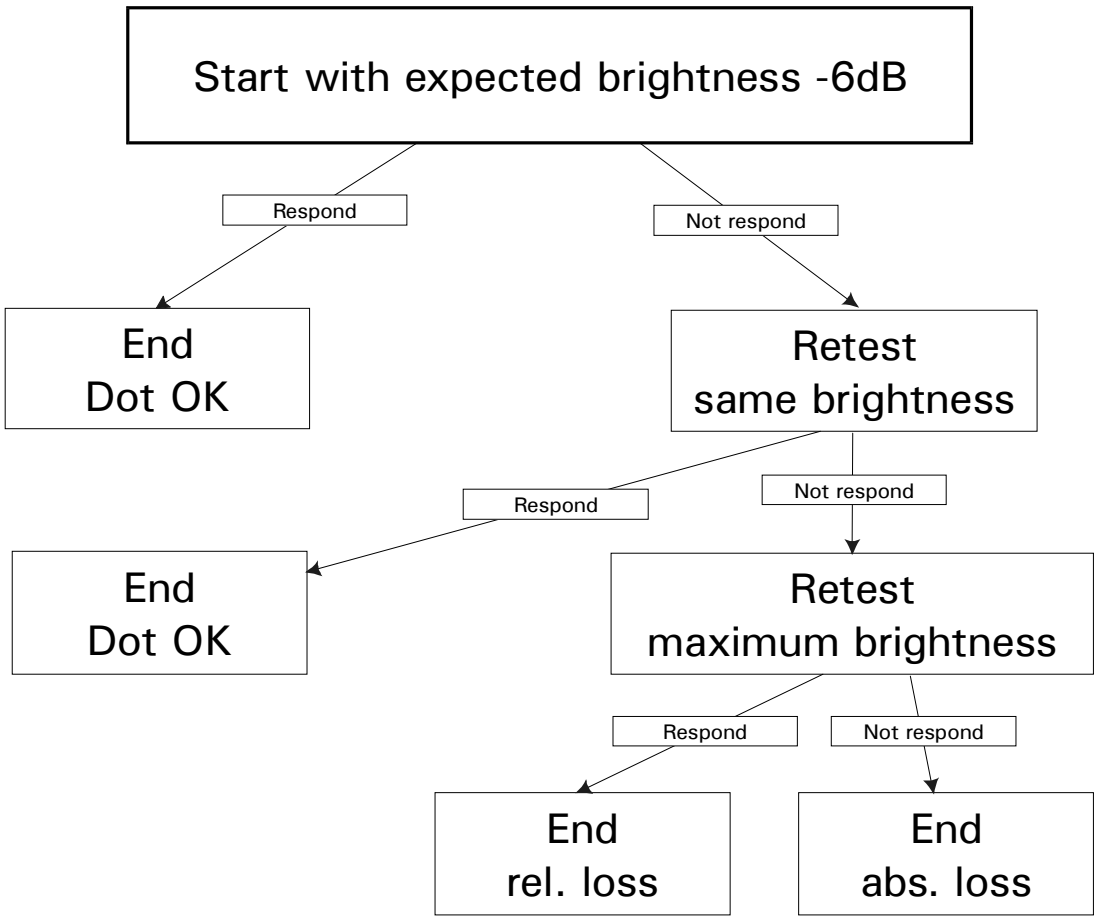
The threshold-oriented – supra threshold strategy deliberately avoids an exact determination of the LDS threshold at each point which is examined; rather, it localizes defects by identifying deviations from the normal course of the test during an initial examination. This strategy thus makes it possible to examine many locations in a relatively short time and to reveal small scotomas.

A test stimulus of 6 dB brighter than expected is presented (first presentation) at each location which is being examined. For example: a test point with 27dB is presented if the expected sensitivity is 33dB.
The test point is classified as normal (circle) if this test point is recognized by the patient (i.e. the response button was pressed), and the program proceeds to the next test point.
If the patient does not react to the stimulus, it is again presented with the same brightness. If the patient recognizes it, this location is classified as normal; if not, it is classified as an absolute scotoma (black square).



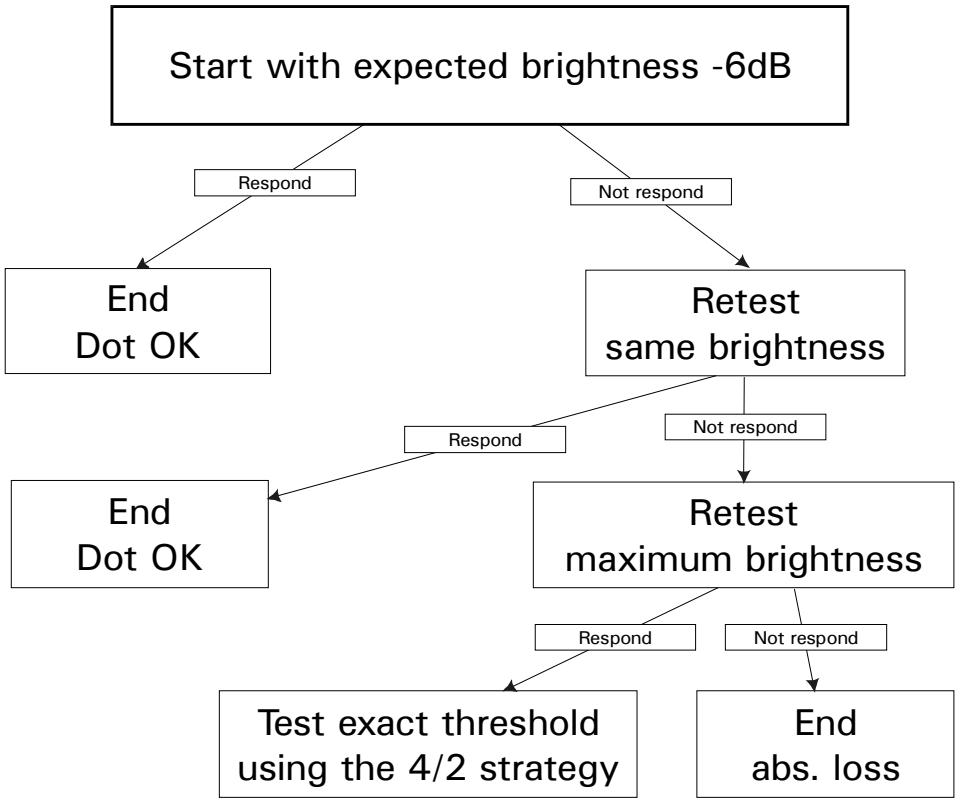
### 7.2.2.5.2 Supra-Threshold 3-zone

The 3-zone strategy proceeds for the most part in exactly the same way as the 2-zone strategy. - However, if there is no response to the second presentation, the stimulus is again shown with full brightness (0 dB). If the patient reacts to this test point, it is classified as a relative scotoma (X), otherwise as an absolute scotoma (black square).



### 7.2.2.5.3 Supra Threshold Quantify Defects

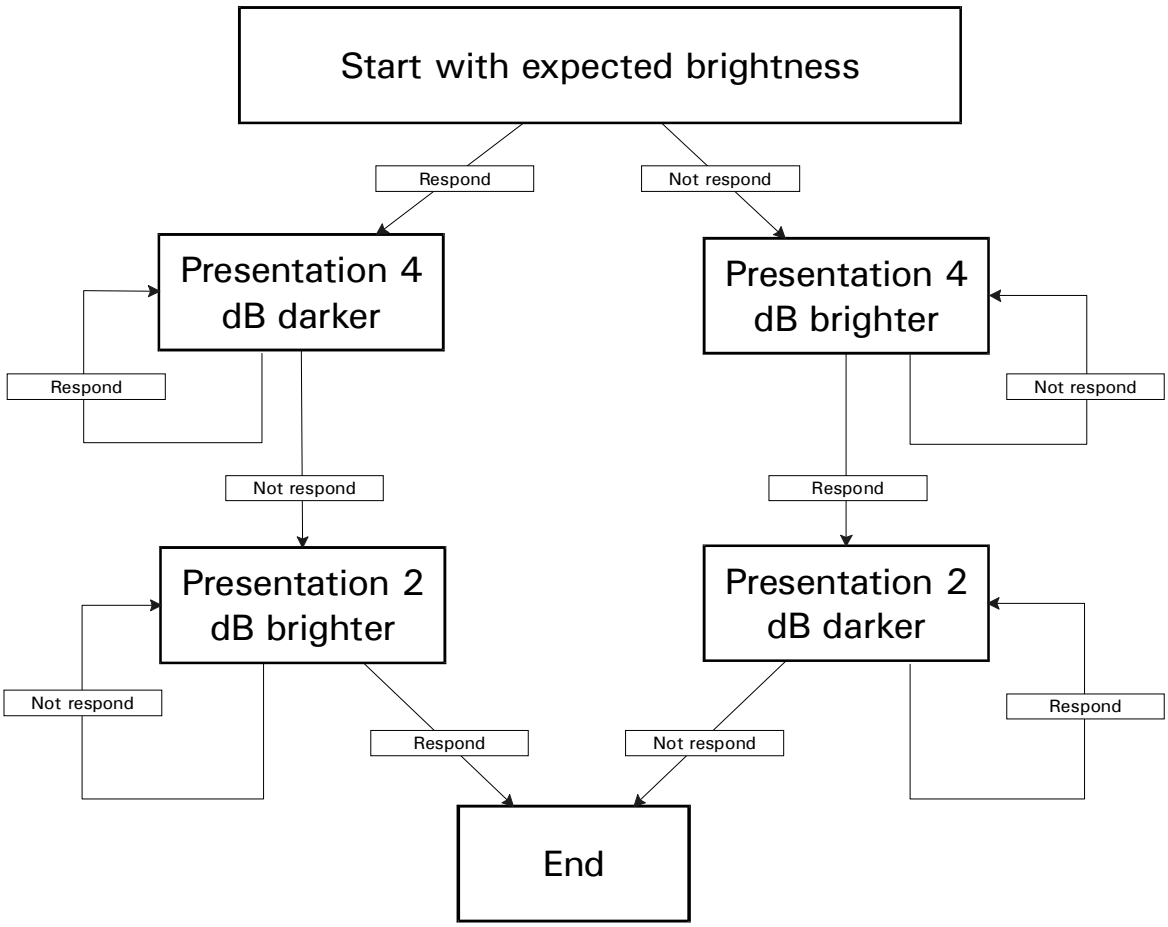
This strategy works like the 3-zone strategy. However, if the patient responds to the stimulus when it is presented with maximum brightness, the location is not only classified as a relative scotoma but the exact threshold value of the scotoma is determined with the help of the 4/2 strategy.



### 7.2.2.5.4 Full Threshold 4/2

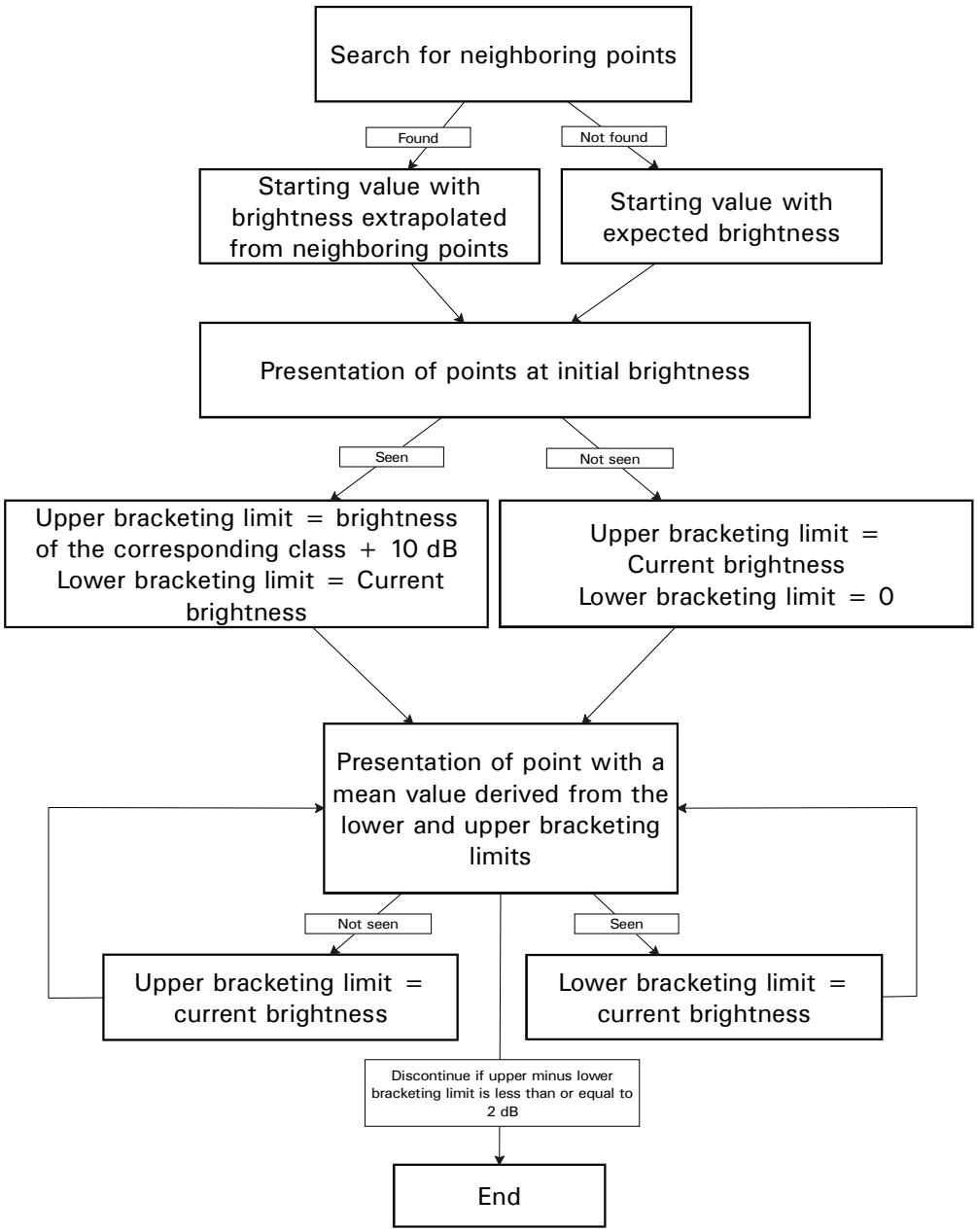
The "Threshold Bracketing Strategy", as it is also called, determines the threshold value as precisely as possible at each grid location. It must be remembered here that the physiologic LDS threshold is not a mathematically precise threshold but rather a transition area between "recognition" and "non-recognition" of a test stimulus. Within this transition area, the probability of recognizing a test stimulus increases or diminishes depending on whether it is presented as bright or dark. There is, thus, no "precise" LDS threshold value; rather, the threshold which is determined with a perimeter must be regarded as having a small factor of uncertainty; this amounts to 2-3 dB. A reliable statement about the LDS threshold can be reached only through repeated determination and subsequent, appropriate calculation of the mean value.
The threshold strategy almost always requires far more presentations for exact measurement of the test point.
At the beginning of the examination, as in the supra-strategy, the central threshold is measured in order to arrive at an approximate estimate of the peak of the visual field hill which is to be measured. This procedure yields quite serviceable starting values for the examination.
The EASYFIELD Perimeter first extracts 4 points from the selected grid and examines them in isolation, in order to present supra threshold points as rapidly as possible. - The patient would promptly tire if a large number of points were to be presented below threshold. Looking at a smaller number of points in isolation has proven to be inadvisable: the examinee requires a certain readapting interval in order to recognize a point which has been presented first above threshold and then dark again, since the subsequent point is "blanked out" by the previous, brighter point.
After completing its examination with these points, the program automatically continues with the next four points.
If a point is regarded by itself, the strategy is as follows:
The program first presents the point at the expected sensitivity (corresponding to the class).

Then the point is "narrowed down" corresponding to the 4 dB / 2 dB strategy.


Start with expected brightness
Respond
Not respond
Presentation 4 dB darker
Presentation 4 dB brighter
Respond
Not respond
Not respond
Respond
Presentation 2 dB brighter
Presentation 2 dB darker
Not respond
Respond
Respond
Not respond
End

### 7.2.2.5.5 Fast Threshold

This strategy, too, is used to determine the threshold value at each grid location.
In contrast to the threshold strategy, four points are not regarded here in isolation, but rather the visual field is examined as a whole. The problem of making presentations "too long below threshold" does not arise with this strategy, since the threshold value which is sought is determined by using a mean value derived in each case from a presentation at maximum and minimum brightness. - In addition, this strategy uses the results of points already examined in the immediate vicinity of the points currently undergoing examination. The Fast Threshold Strategy is less informative than the Threshold Strategy if the patient's answers are false, but comes to the same results if his cooperation is good, while being considerably faster.

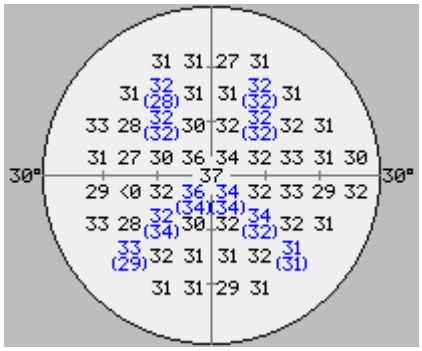


### 7.2.2.6 Short Term Fluctuation (SF)

If some locations are measured twice, it is possible to calculate the Short Term Fluctuation of the examination. The Short Term Fluctuation is a value for the retest variability of the sensitivity results.

If Short Term Fluctuation is switched on, 10 fixed locations are measured twice, both dB-values are shown with blue color at the screen, the second value is shown with brackets. These twenty dB-values are used to calculate the statistical value SF (shown at Statistics / Defect Curve).

The duration of the examination is longer when the fluctuation test is activated.




The fluctuation test is not used with a supra-threshold strategy, as there are no dB-values with this strategy.

### 7.2.2.7 Fixation (Fix)

Fixation is tested repeatedly during the course of the examination. Two methods are provided for this:

- Fixation monitoring with the **Heijl-Krakau** method presents a stimulus to the blind spot at regular intervals. If the stimulus is recognized, the response is regarded as "false" and is incorporated into the evaluative checks of fixation.
- The **Central** Fixation Check offers at regular intervals a stimulus at the center, which is 8dB brighter than the measured central threshold value. The response counts as false if the stimulus is not recognized.

### 7.2.2.8 Speed (Spd)

Reaction times vary among individual patients. For this reason, the stimulus interval and the corresponding allowable reaction time following presentation of a test point can be adjusted here. If "Adaptive" is selected, speed during the examination is automatically adjusted to match the patient's reaction time.

### 7.2.3 Information Boxes

In the upper right of the screen you find continuously updated information during the examination. These are:


- **Examination date (Exm)**
  The examination number is written in brackets behind the date.
- **False Positive Errors(F.P.)**
  The reliability of the patient's responses is tested at regular intervals by checking his use of the response button after a short pause. A response by the patient to a test point which was not presented is classified as false positive. For example, "0/21" means that 0 out of 21 of the patient's responses were to test points which were not presented.
- **Fixation Losses (Fix)**
  Shows, how many fixation tests were made during the examination, and how many tests were not passed. “1/26” means: The fixation was tested 26 times, and the patient did not pass 1 test.
- **Remaining dots (Rem)**
  Shows the number of locations which are still to be examined.
- **Total Presentations (Tot)**
  The total number of presentations, incl. fixation and response checks, is shown here.
- **Duration (Dur)**
  The elapsed examination time.
- **Absolute Losses (Abs)**
  The number of absolute scotomas which have been measured.
- **Relative Losses (Rel)**
  The number of relative scotomas which have been measured (not used in fast or full threshold strategies).

### 7.2.4 How to Carry Out an Examination

#### 7.2.4.1 Prepare for an Examination

For the preparation of the examination, please cover the eye which is not to be examined with the occluder. Take care that the patient is sitting comfortably. Adjust the height of the unit accordingly by moving the funnel up or down.
For the positioning of the patient’s eye, please follow the instructions below:

1. The patient now places his forehead on the headrest, so that he can see with the eye to be examined the four fixation marks. The patient has to fix his gaze on the center of the four marks.
   Adjust the headrest to the right or left, depending on which eye will be examined (Right eye: Move headrest to the left).
2. Now check the correct height of the eye by observing the patient from the side and directing him, in order to place his eye which is to be examined exactly in the middle between the upper and the lower edge of the lens.
3. Observe the camera image, and direct the patient into the correct position (only to left and right), in order to place his pupil in the center between the right and left bar of the red rectangle.
4. Please check once more the height of the patient's eye from the side, and, if necessary, repeat the steps 2 and 3.

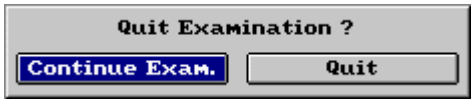
### 7.2.4.2 General Remarks

The patient can interrupt the examination at any time by continuously pressing the response button.


The examination then continues automatically as soon as he again releases the button.

The examiner himself can interrupt the examination by pressing the right button.

This opens the following window:

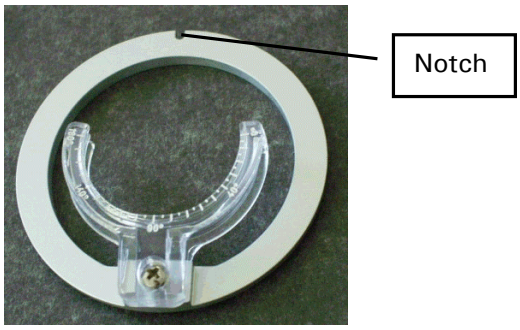


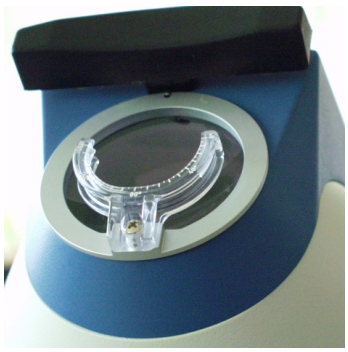

Press the **[Continue Exam.]** button to continue the examination.
Please make sure that the pupil is in the center of the red rectangle again when the examination is continued.

The examination time is shown continuously during the examination.

### 7.2.4.3 Inserting the lens holder

For patients needing a correction can use their glasses or contact lenses. Alternatively you can correct them by mean of small rim lenses for the lens holder supplied with the instrument.
Please insert the lens holder into the view in of the Easyfield with the adjustment pin sitting in the notch of the lens holder. Now insert the needed correction lenses.



### 7.2.4.4 How to Start the Examination

After the examination parameters have been entered select the item “Start” from the menu item “Examination”.

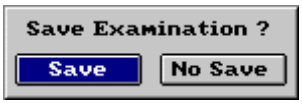
You can also press the button at the upper left twice.


The following window appears:

Select **[Start]** to start the examination.

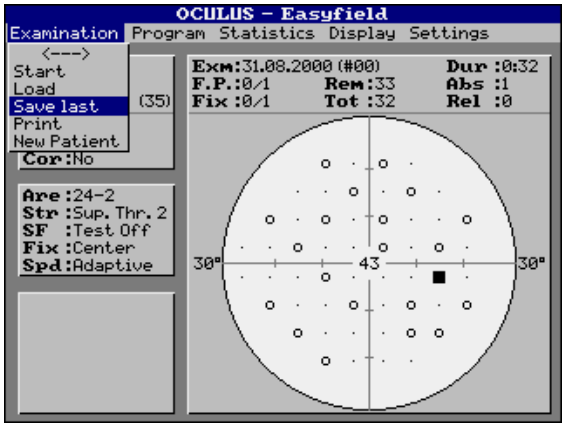
### 7.2.4.5 How to End the Examination

After completion of the examination the following window appears:




You can save the examination results immediately by selecting the **[Save]** button.

Should an examination inadvertently not be saved after its completion, you can still save it manually by selecting "Examination/Save last" in the menu bar.



### 7.2.4.6 Quick Start Programs

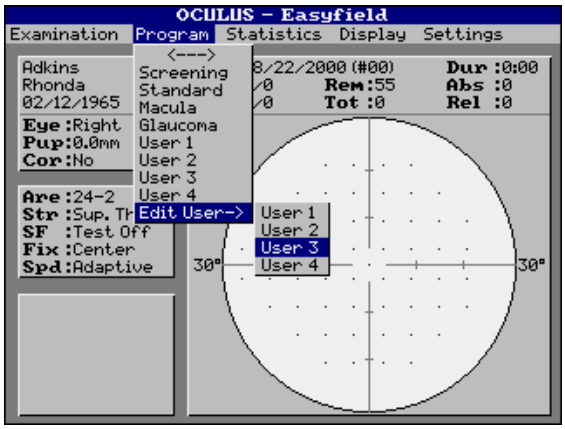
There are four predefined programs stored in the Easyfield: Screening, Standard, Macula and Glaucoma. These programs correspond to a combination of the examination parameters as area, strategy, fixation method, speed and short time fluctuation.

| Program | Area | Strategy | Fixation | Speed | SF |
|---|---|---|---|---|---|
| Screening | 24-2 | Sup.Thr.2 | Center | Adaptive | Test Off |
| Standard | 30-2 | Sup.Thr.Q. | Center | Adaptive | Test Off |
| Macula | 10-2 | Fast Thr. | H.Krakau | Adaptive | Test On |
| Glaucoma | 30-2 | Fast Thr. | Center | Adaptive | Test On |

Select “Program” from the menu bar and then the desired program. You will be asked for the eye to be examined, and then the examination starts.


#### 7.2.4.6.1 User Defined Programs

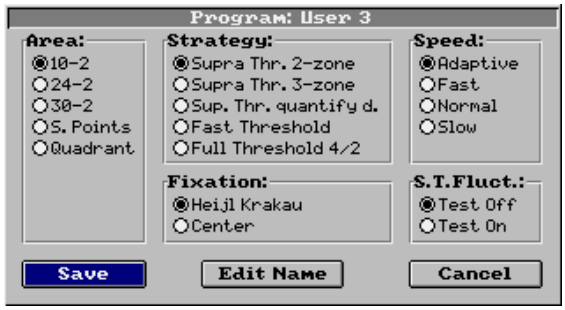
You can define your own programs. Initially there are four programs named User1 to User4. You can change these names and their corresponding parameters by selecting “Edit User->” and one of the four user programs.

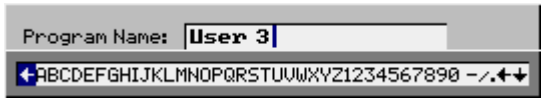



Select the desired parameters and choose another name for this program by pressing “Edit Name”.
If a program bears the name “Autostart” or “Auto Start”, this program will always be loaded automatically as soon as you start the examination software.

If you are finished with changing the program name, press the button right from the control knob.

Now save your changes with “Save”.

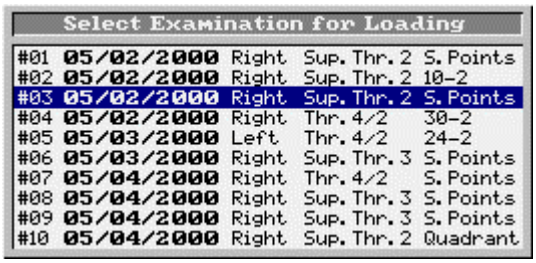


### 7.2.5 How to Load Stored Examinations

Select "**Examination**" from the menu bar and then the item "**Load**".

Now select the desired examination and click the left button.
The examination is then displayed.

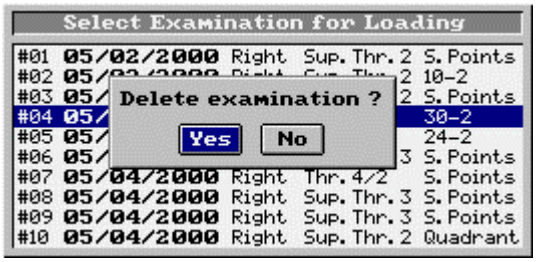



### 7.2.6 How to Delete a Stored Examination

Select "**Examination**" from the menu bar and then the item "**Load**".
Now select the desired examination and press the fourth button from top on the left side of the screen (Key 4).

Answer the following question with **[Yes]**.

**Remember that the data are irretrievably lost after deletion.**

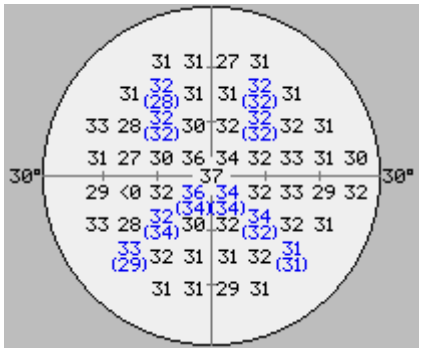


## 7.2.7 Displaying Examination Results

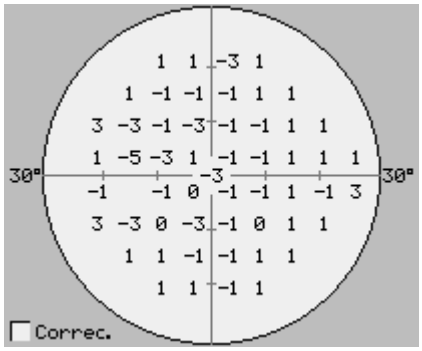
You have several options of displaying examination results graphically in the Easyfield program.

For this purpose, select one of the following items under the "**Display**" heading:

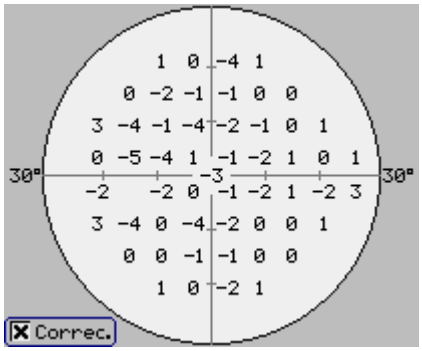
- **Standard**
  Displays selected stored examination results in standard mode (Absolute values).



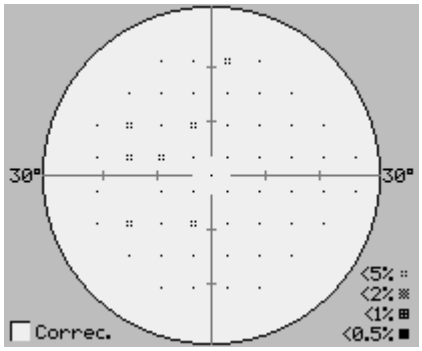

- **Relative**
  Displays the patient's results in comparison to the stored results of a group with normal values. Positive numbers mean that the patient's recognition ability is better than the normal values, negative numbers mean that it is worse than the normal values.



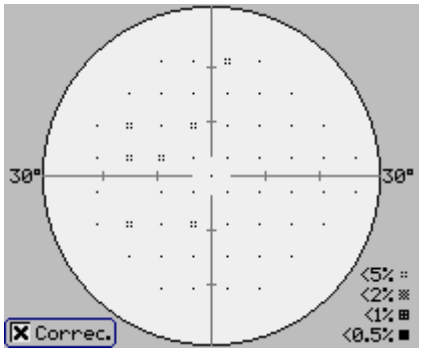

- **Relative Corrected**
  Raises or lowers the entire visual field hill such that global deviations are no longer visible. This reveals local defects which one would miss at first sight in a globally lowered visual field (e.g. in the case of a cataract).



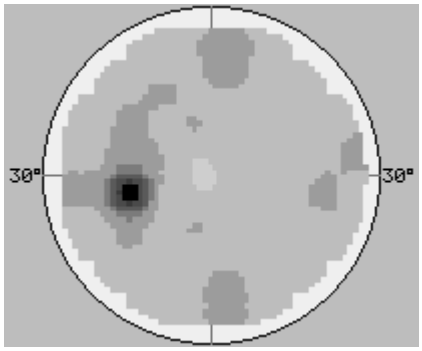

- Probability
  In the Probability display mode the relative deviation is shown graphically, i.e. with symbols instead of numbers. The darker the symbol the less likely it is that the visual field is normal at this point. For instance, as the legend at the bottom right shows, a black square means that the probability of this deviation occurring in a normal person is less than 0.5%.



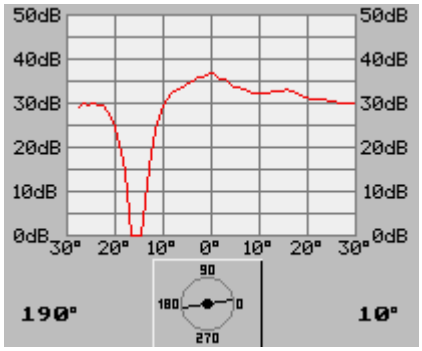
- **Probability Corrected**
  This display mode is equivalent to the probability display mode, except that any global deviation is mathematically eliminated (see Relative Corrected mode).



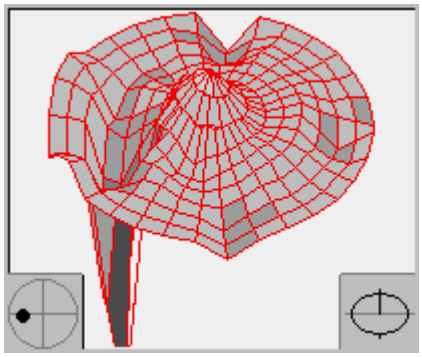

- **Greyscale**
  Permits you to view threshold strategy results in the form of a greyscale printout.




- **Profile**
  This function serves to display a sectional profile which is calculated from the examination results.
  You can change the position of the sectional profile: Move the cursor to the rotation button and press the “Enter” key. Now the sectional angle will follow the control knob position. Quit the angle selection with the “Enter” or “Cancel” key.




- **3D**
  The 3D display lets you view the selected examination as a visual field "hill", i.e. in three dimensions as it were. This display form is particularly helpful in explaining the visual field to the patient.
  Two buttons appear in the graphic display. Use these buttons to change the appearance of the 3D topographic hill: the left button rotates it, the right button tilts it. To use the buttons, move the cursor by turning the control knob until it appears at one of the buttons (B1). Press the “Enter” key to enter the selection, the button is now shown blue (B2). Use the control knob to rotate the button to the desired position, and press the “Enter” key to update the 3D image (B3). Pressing the “Cancel“ key, quits the rotation selection (B4).



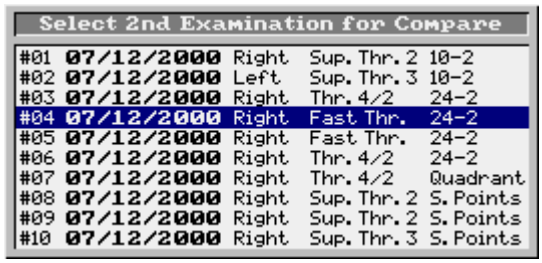
## 7.2.8 Statistical Analysis

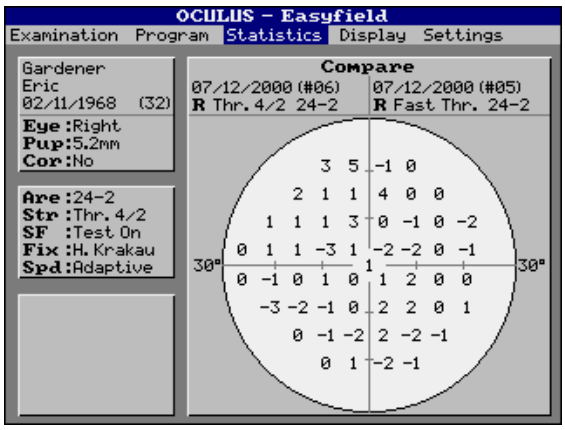
The menu item **"Statistics"** offers you the possibility of comparing examinations and evaluating them statistically.

### 7.2.8.1 Compare Examinations

Load a fast- or full-threshold examination and select **"Statistics"** / **"Compare"**.

The display changes now to the compare mode, and a selection box opens, to load the second examination to calculate a comparison map. After this selection, the second examination is loaded (if it is not a supra threshold examination) and the comparison map is shown.



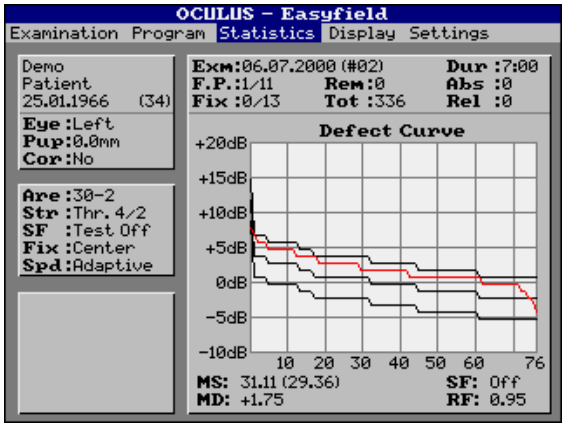




A positive value in this map indicates that the sensitivity became higher, a negative value indicates that the sensitivity became lower. The comparison map shows always the dB value of the new examination minus dB value of the old examination, independent from the loading order.

The headline of the compare window shows which examinations are used for comparison (Examination date and number, Eye, Strategy, Area).

## 7.2.8.2 Defect Curve and Statistical Values

A fast- or full-threshold examination allows its statistical evaluation. To display this evaluation select **"Statistics"** / **"Defect Curve"**.




- **Defect Curve**
  The Defect Curve (cumulative defect curve) shows the examination results "without addresses", i.e. the position of the individual measuring points are not included in the curve. The deviations in the threshold values are sorted in descending order from left to the right. The abscissa shows dB values, the number of the test points are shown on the ordinate. Three black curves show the "normal area", the range of tolerance. The red curve represents the evaluation of the current measurement.

- **MS (Mean Sensitivity)**
  This is the mean sensitivity of all previously determined threshold values. The value in brackets is the mean sensitivity level of normal values in relation to the age group and the examined patient. If the normal value is below that of the patient, his or her result is better.

- **MD (Mean Deviation)**
  The mean sensitivity loss is derived from the difference between the normal value and the MS value which has been determined for the patient. If MD is positive, the mean sensitivity which has been determined is better than the norm for that age.

- **RF (Reliability Factor)**
  This factor combines the results of the fixation monitoring and of the patient's false positive responses. If the patient's cooperation is acceptable to very good, the result should lie between 70% and 100% (i.e. a value between 0.7 and 1.0); this means that on the average 70% to 100% of the response checks and fixation monitoring questions were correctly answered.

- **PSD (Pattern Standard Deviation)**
  Measures the deviation in shape of the visual field from the shape defined by the stored set of normal values. A low PSD value points to a smooth-shaped visual field, whereas a high PSD value is indicative of marked irregularities.

- **SF (Short Term Fluctuation)**
  The Short Term Fluctuation is a value for the retest variability of the sensitivity results.
  If the Short Term Fluctuation test is switched on during the examination, 10 locations are measured twice. The statistical value SF shows the variability of these double measurements. To calculate SF, the mean differences between the first and second measurements of these 10 locations are used.

- **CPSD (Corrected Pattern Standard Deviation)** A high PSD value may either be due to deviations in a patient's responses or to real irregularities in the patient's visual field hill. The CPSD value is calculated from the Short Term Fluctuation (SF) in order to correct for deviations in the patient's responses, thus permitting a distinction between these two causes.

## 7.2.9 Settings

Select the menu item “Settings” in the examination program to change the following settings:

### 7.2.9.1 Brightness of Camera Image

It can be necessary to adjust the brightness of the CCD-camera, because of the different room brightness, and because of the different iris structure of the patients.
In order to change the brightness of the camera image, select "Camera" from the menu bar of the examination program (the camera image is visible at the lower left).
Now adjust the value with the control knob and confirm your choice with the "Enter" button.
The chosen value is then saved and remains in force even after the unit is turned off.

### 7.2.9.2 Brightness of Display

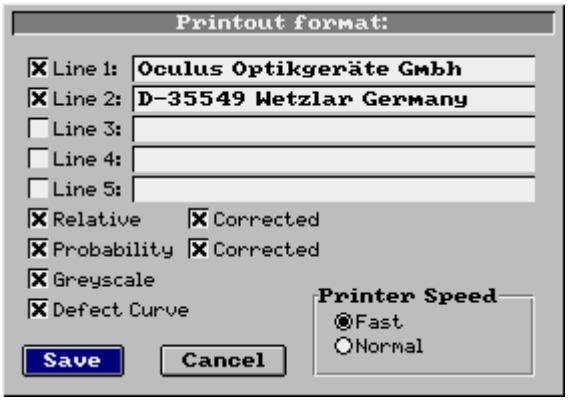
Adjust the brightness of the display by choosing "Display". Now choose the correct brightness by turning the control knob.

### 7.2.9.3 Printout Format

Here you can make adjustments of the printout. It is possible to define five additional lines which will be printed as a title on every printout.

To do that, mark the desired lines and fill in the fields which are placed at the right side. Please navigate within the fields with the control knob.

If an examination has been carried out with a threshold strategy, you can additionally print out a "Greyscale", a “Probability” a "Relative" or a "Defect Curve"-Plot when you mark the according boxes. “Relative” and “Probability” can each be additionally printed out in their corrected form.




The speed of the printer can be adjusted by selecting "Printer Speed". "Fast" probably causes a pale printout but which is approx. 60% faster.
Save the changes with "Save".

### 7.2.10 Hotkeys

Important functions within the examination program are directly retrievable by the four keys beside the screen. These are:

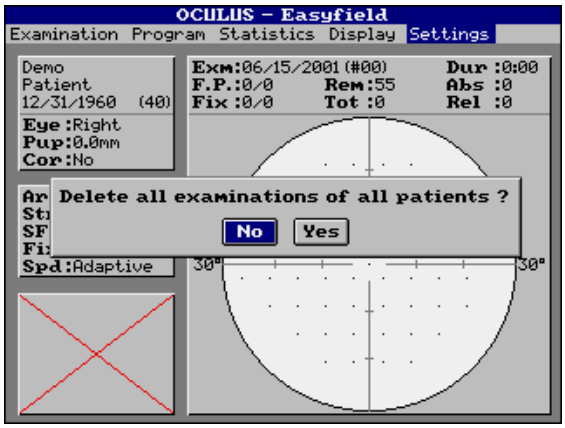
| Key | Function |
|---|---|
| Key 1 (top) | Single click: Roll up the menu "Examination"<br>Double click: Start the examination |
| Key 2 | Open the menu “Eye” |
| Key 3 | Open the menu “Area” |
| Key 4 (bottom) | Open the menu “Pupil size” |

#### 7.2.10.1 Delete All Examinations of All Patients

**This function deletes all examinations of all patients. Please be sure having stored these data with the PC software before.**

In the examination program, move the cursor to the menu item "Settings" with the control knob. Now press both keys besides the control knob and the lowest beside the display simultaneously (To do this start with the “Cancel” key, add the “Enter” key, and add the “Key 4”).

These actions must be confirmed twice, before any data will be erased.



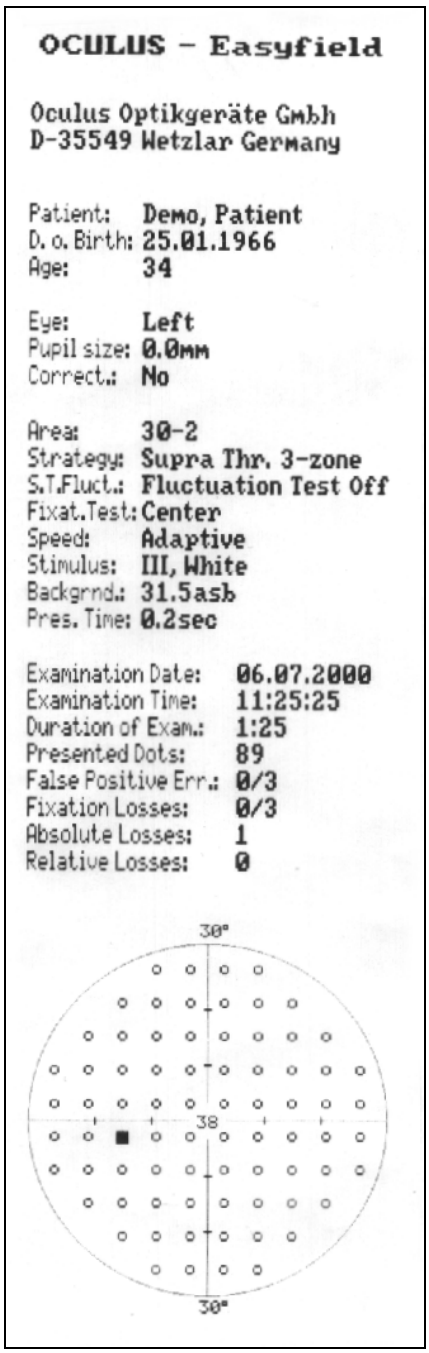
## 7.2.11 How to Printout Examination Results

You can print out the examination results immediately with the integrated printer.

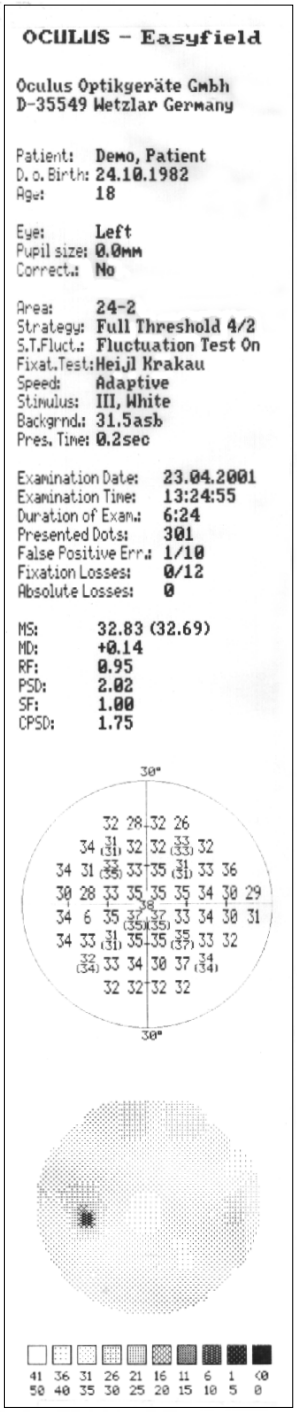
Select the menu item **"Examination"** and then **"Print"**.

### 7.2.11.1 Sample Printouts

#### 7.2.11.1.1 Supra Threshold Strategy



## 7.2.11.1.2 Threshold Strategy



OCULUS – Easyfield

Oculus Optikgeräte GmbH
D-35549 Wetzlar Germany

Patient: Demo, Patient
D. o. Birth: 24.10.1982
Age: 18

Eye: Left
Pupil size: 0.0mm
Correct.: No

Area: 24-2
Strategy: Full Threshold 4/2
S.T.Fluct.: Fluctuation Test On
Fixat.Test: Heijl Krakau
Speed: Adaptive
Stimulus: III, White
Backgrnd.: 31.5asb
Pres. Time: 0.2sec

Examination Date: 23.04.2001
Examination Time: 13:24:55
Duration of Exam.: 6:24
Presented Dots: 301
False Positive Err.: 1/10
Fixation Losses: 0/12
Absolute Losses: 0

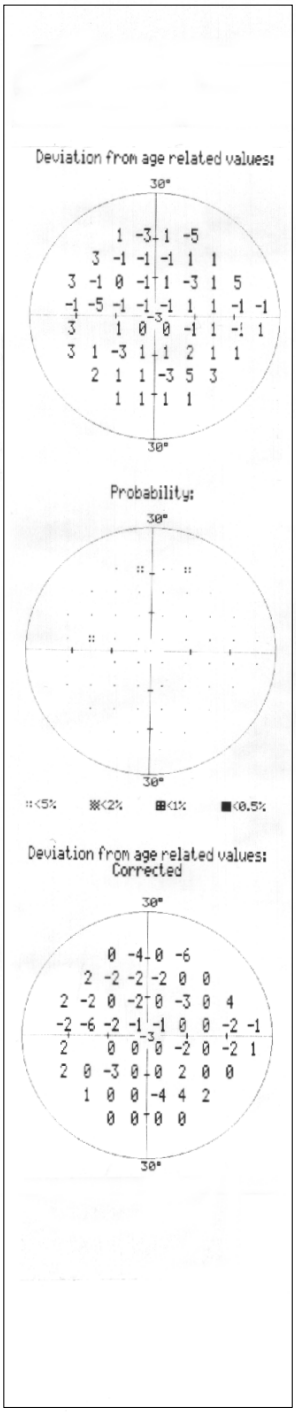
MS: 32.83 (32.69)
MD: +0.14
RF: 0.95
PSD: 2.02
SF: 1.00
CPSD: 1.75











Deviation from age related values:



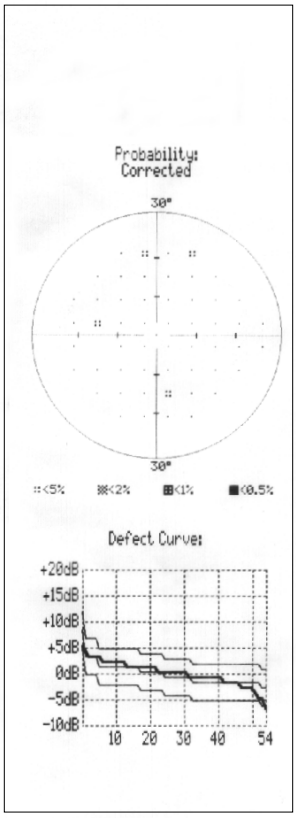

Probability:




<5% <2% <1% <0.5%

Deviation from age related values:
Corrected



Probability:
Corrected




<5% <2% <1% <0.5%

Defect Curve:

## 7.3 Communicating with the PC

The Easyfield control unit can exchange data with a PC. This makes it possible to save copies of examination results (Backup), to import examination data (Restore), and to update the software of the control unit.

To use these functions, first disconnect the Easyfield control unit from the Easyfield perimeter. Now connect the PC to the Easyfield control unit, using the interface cable delivered with the Easyfield.

**Never connect or disconnect a plug while the PC or the EASYFIELD Perimeter are turned on!**

This interface cable (or download cable) has a 9 pin connector on each side. One side is labeled “PC”, this side must be connected to a serial interface (RS232) of the PC. The other side of the cable provides the 9-pin connector and an additional small jack, which is used to connect the Easyfield power supply. This side must be connected to the control unit and the power supply.

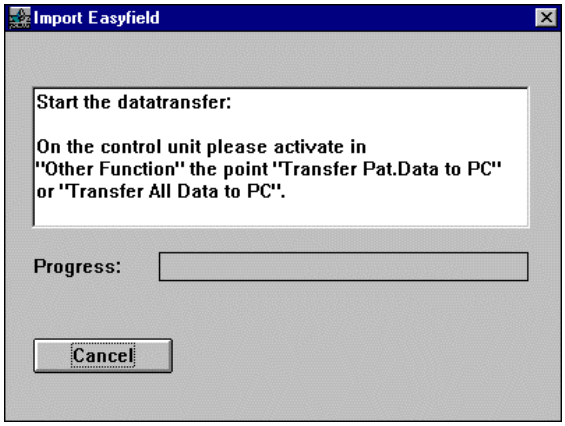
After connecting the control unit and the power supply, the control unit should show the normal starting screen. If this is not the case, check whether the cables are correctly connected.

For data exchange with the PC, a special software (which belongs to the standard equipment) is used. Install this software at your PC first (see 8.1,page 43)

For data transmission with the PC, it is necessary to know the number of the COM port (serial port, RS232) to which the interface cable is connected at the PC. This COM port (COM1, COM2, COM3, COM4) must be set in the communication software. Refer to your PC users manual to find the COM numbers of the PC connectors. A notebook usually has only one connector: COM1. A desktop PC has usually two connectors COM1 and COM2.

### 7.3.1 Transfer Examination Data to the PC

To transfer data from the control unit to the PC, the PC software must be started first. Select from the “OCULUS” program group the icon “Easyfield”. The patient data management software appears (see 8.2, page 44).
Select **[Settings]** and set the serial port (Ser.Port) to the COM Port on which the control unit is connected with your PC.
Select **[Import]** and **[Easyfield]**. The following window opens:

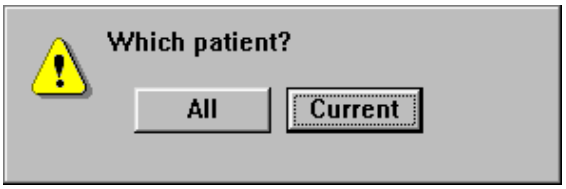



This window shows, that the PC is waiting for data.
The Easyfield control unit must start the data transfer now:
Select **[Other Functions]** at the control unit.
Now select **"Transfer Pat. Data to PC"** or **"Transfer All Data To PC"**, depending on whether you wish to send the data of only one or the data of all patients to the PC. In the first case, only the examination data of the currently selected patient are sent to the PC. A moving bar keeps you informed on the progress of the data transfer.

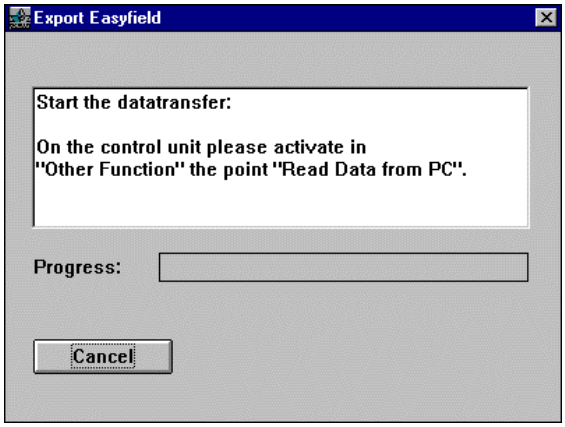
### 7.3.2 Importing Examination Data from the PC

To transfer data from the PC to the control unit, the PC software must be started first. Select from the “OCULUS” program group the icon “Easyfield”. The patient data management software appears (see 8.2, page 44).
Select **[Settings]** and set the serial port (Ser.Port) to the COM Port on which the control unit is connected with your PC.

Select a patient and (if only one examination should be transferred) a specific examination. Now select **[Export]** and in the following dialog menu select **[Easyfield]**. A question will appear at the PC screen:




Now you can decide if you want to transfer only the current patient or if you want to transfer all data stored at the PC. After this selection, the following window opens:




This window shows, that the PC is waiting to transfer data now. The Easyfield control unit must start the data transfer now:

Select **[Other Functions]** at the control unit. Now select **"Read Data from PC"**. to start the data transfer. A moving bar keeps you informed on the progress of the data receiving.

### 7.3.3 Software Update

Software updates for the control unit are provided by OCULUS. The update is made using an additional PC program “Easyfield Boot Manager”, which belongs to the standard equipment. Install this software at your PC first (see 8.1, page 43).

The file at your PC which contains the operating software of the control unit is called:"MF.A37". It is stored in the "C:\EASY" directory of your PC hard disk.

To update the software of the control unit disconnect it from the Easyfield perimeter, and connect it to the PC, using the interface cable delivered with the Easyfield.

This interface (or download) cable has a 9 pin connector on each side. One side is labeled “PC”, this side must be connected to a serial interface (RS232) of the PC. The other side of the cable provides the 9-pin connector and an additional small jack, which is used to connect the Easyfield power supply. This side must be connected to the control unit and the power supply.

Now start the PC-Software "Boot Manager". The icon is located in the “OCULUS” program group.

The software update can be started in two different ways:

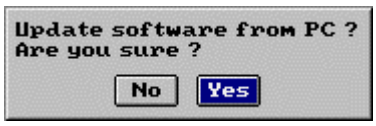
- Software Mode
- Hardware Mode

The **"Software-Mode"** update eliminates the need of opening the control unit. This will be sufficient in most cases.
However, should a power outage or any other error occur during the software update, the control unit will not be able to work. In this case the Display of the control unit will remain black after power on, because the software can not be started after an invalid transmission. If this happens, the software can still be updated with the **"Hardware-Mode"**.

### 7.3.3.1 The Software Mode

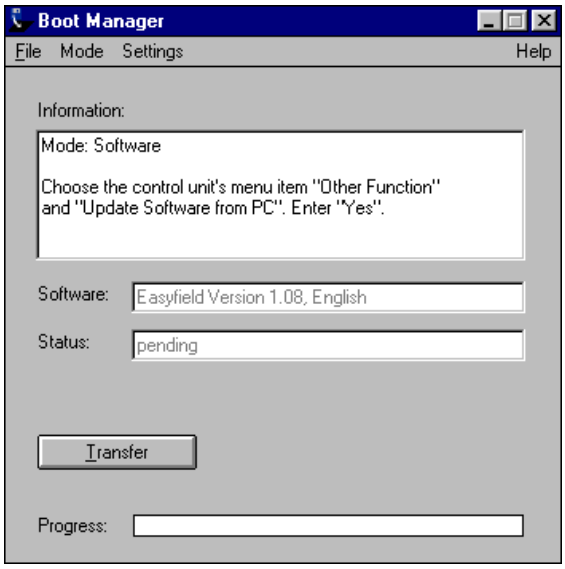
Start the PC-software "Boot Manager". Select "Settings" and select the COM port (serial interface) to which the control unit is connected with your PC.

Now select on the control unit: **"Other Functions"** and then **"Update Software From PC"**. Confirm your selections with **[Yes]**.




The control unit now shows on a blue screen the message "Update Software", it is waiting for software now.

To start the software update click the **[Transfer]** button of the PC software "Easyfield Boot Manager".



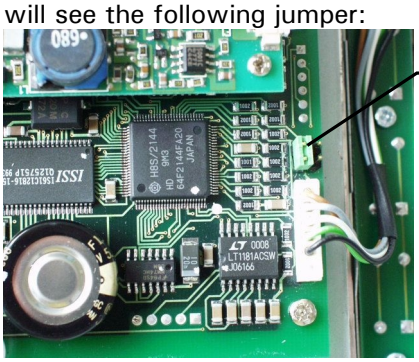

The moving blue bar (PC software) keeps you informed on the progress of the software update procedure.
After finishing the software update, the control unit shows automatically the normal starting screen. This indicates, that the updating procedure was successful.

### 7.3.3.2 The Hardware Mode

To start the software update in the mode “Hardware”, the control unit must be prepared first. To do this a jumper on the electronic board must be moved, so the control unit must be opened:

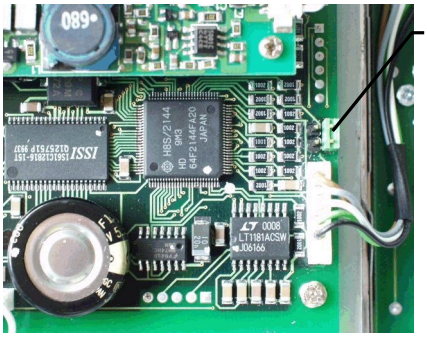
**Unplug the main cable of the power supply unit.**

Turn over the control unit and unscrew the four screws on its bottom. Now remove the cover of the housing. On the right side you will see the following jumper:



Jumper in parking position (left side)

Remove this jumper and replace it as shown here:



Jumper in update position (right side)

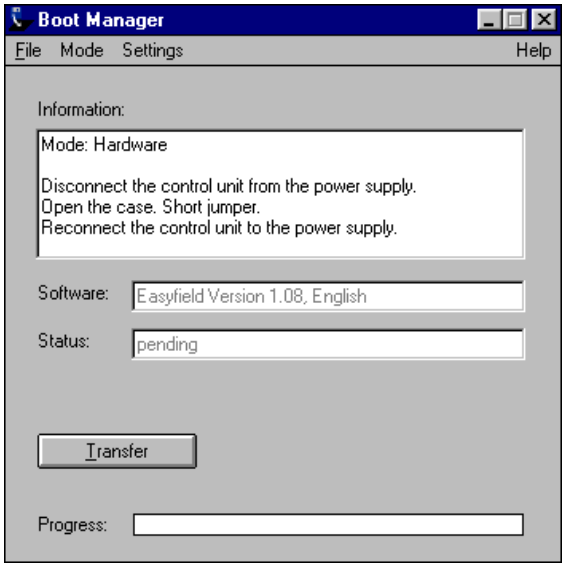
Screw the cover back on to the housing in order to protect the electronic elements.

**Never connect the power supply unit to the control unit when the cover of the housing is open.**

Reconnect the power supply unit.

The display of the control unit will now remain black, although the power is on.
After preparing the control unit, the PC software “Boot Manager” must be started.

Select "Settings" and select the COM port (Serial interface) to which the control unit is connected with your PC. Select also “Mode” and switch it to “Hardware”. To start the software update click the **[Transfer]** button.




The moving blue bar (PC software) keeps you informed on the progress of the software update procedure.
After finishing the software update, the control unit shows automatically the normal starting screen. This indicates, that the updating procedure was successful.

Upon completion of the transfer, it is important to put the jumper back to the parking position (Otherwise the display will still remain black after power on the control unit !):

**Unplug the control unit again from the main power supply.**

Open the cover of the housing.
Restore the jumper to its original position.
Close the cover of the housing and screw in the screws.

# 8 Using the PC-Software

The software on the floppy disk or CDROM included in this delivery consists of two modules:

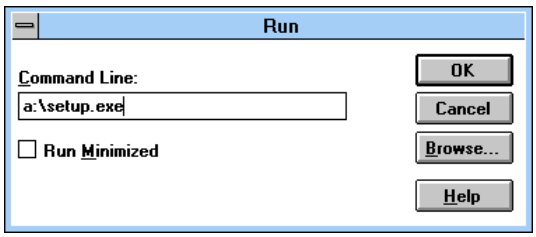
- The examination software for transferring patient and examination data between the PC and control unit or to operate the Easyfield via the PC.
- The update software for updating the software of the control unit (Boot Manager).

## 8.1 Installation of the Software

### 8.1.1 Windows 3.x

- Insert the disk/cdrom **Easyfield (56930)** into its corresponding drive.
- Click in the "Program-Manager" menu bar "**[File/Run...]**".
- Enter "**X:\setup.exe**" and click the button "**[OK]**" (X is the drive where the disk/cdrom was inserted).

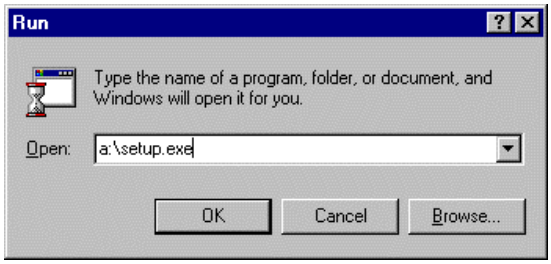
Follow the installation instructions.




### 8.1.2 Windows 95/98/2000

- Insert the disk/cdrom **Easyfield (56930)** into drive "A".
- Click "**Start**" in the "**Start**" menu, then "**Run**" in the subsequent pop-up menu.
- Enter "**X:\setup.exe**" and click the button "**[OK]**" (X is the drive where the disk/cdrom was inserted).

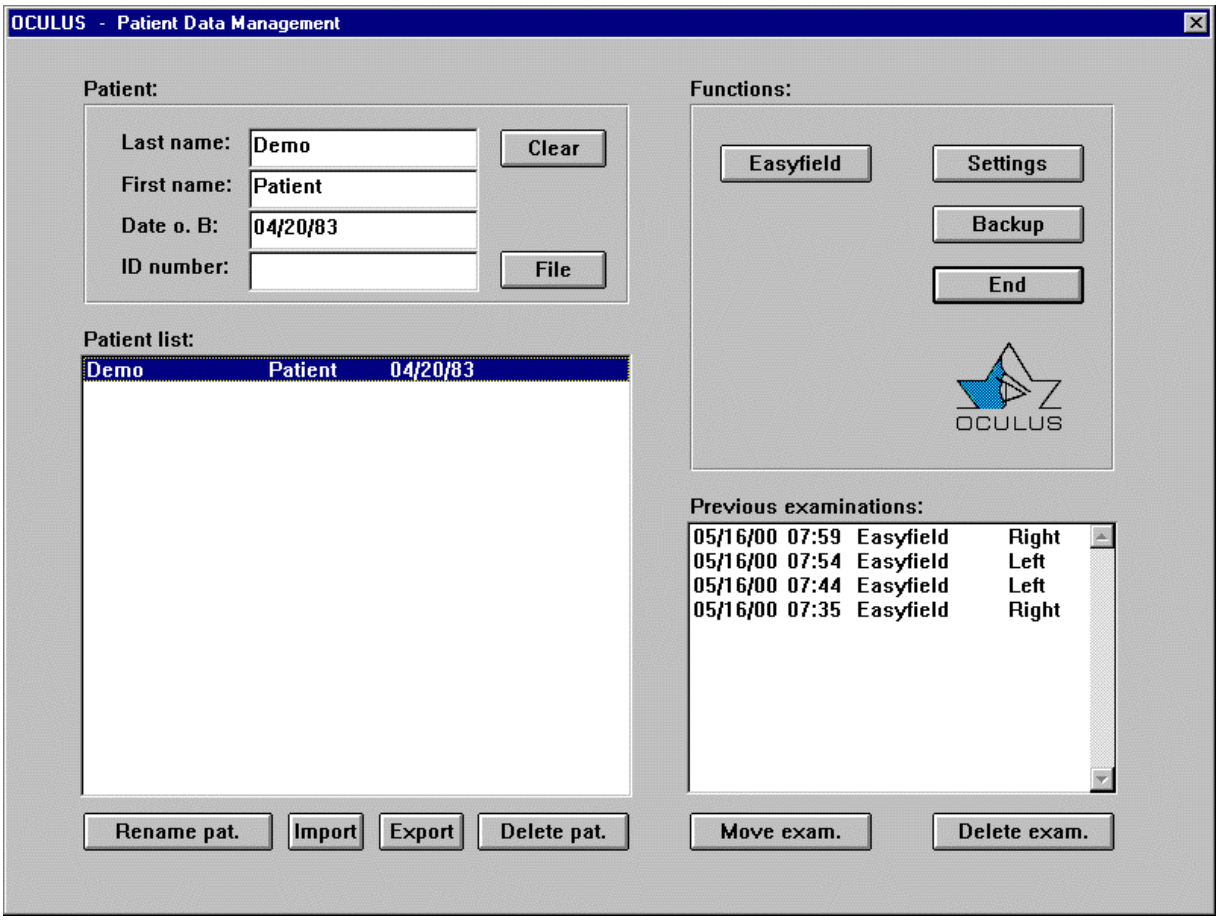
Follow the installation instructions.



## 8.2 Patient Data Management

Start from the OCULUS program group the PC software “Easyfield”
The patient data management system can now be started with a mouse click or by pressing any key.

The following window appears on the screen:



### 8.2.1 Patient Selection

All patients stored in the past are now listed alphabetically on the lower left of the screen.

If the list of patients is too long to be displayed on the screen, it can be scrolled up or down with the Windows slide bar.

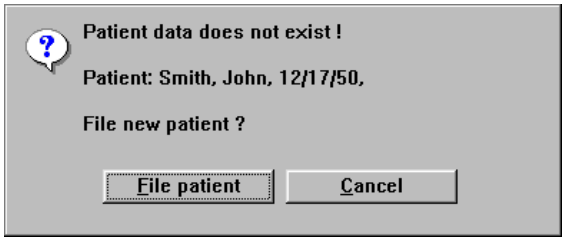
In order to find the desired patient in the list, it is helpful to type the patient's name in the "Last name:" box (at the upper left). As each new letter is typed, the name is searched for in the list and the display is updated.
The patient can also be found by means of his or her ID number (in this case, however, the "Last name:" box must be empty).

After the patient name has been found in the list, it is transferred to the "Patient" boxes by clicking the name in the list. Simultaneously, all previous examinations of the patient are then listed in the "Previous Examinations:" window at the lower right.

### 8.2.2 How to Enter a New Patient

To enter a new patient into the patient data management system, first click the **[Clear]** box. This clears the box of any previous patient names. Then enter the complete last name, first name and date of birth in the corresponding patient boxes (at the upper left).

An ID number may be assigned to the patient, however this is not required.
Now click the **[File]** button. The following message then appears:



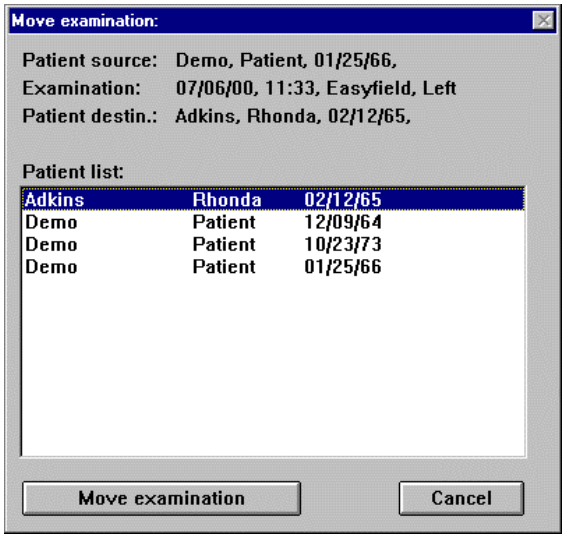

Clicking the **[File patient]** button enters the patient into the patient list.

### 8.2.3 How to Delete / Relocate Examination Results

Two buttons are found below the "Previous examinations:" list. These are used to activate functions which are always related to the last examination which has been clicked:

**[Delete exam.]**
This button deletes individual examinations from the patient data management system.
When the button is activated, the question is again asked whether you really wish to delete this examination.

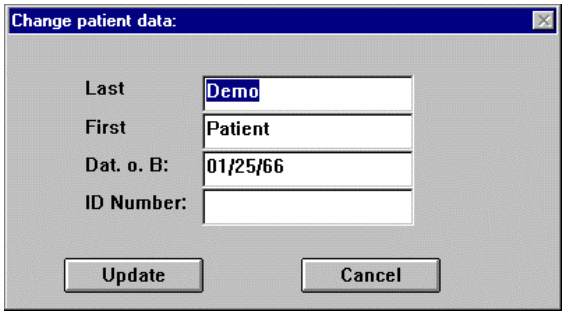
**[Move exam.]**
If an incorrect patient name was inadvertently selected from the examination list during an examination, the examination results can be subsequently assigned to the correct patient.




Activating the **[Move exam.]** button opens a window containing the patient list to appear.
The correct patient can now be selected from this window.
If the list of patients is too long to be displayed on the screen, it can be scrolled up or down with the Windows slide bar.
After the correct patient name has been found and selected, the current examination data are assigned to it by activating the **[Move examination]** button.

### 8.2.4 How to Rename Patient Data

Patient data can be changed subsequently with the **[Rename pat.]** button. This causes the **"Change patient data"** window to appear, in which the patient data can be corrected.
The changes are put into effect with the **[Update]** button.




### 8.2.5 How to Delete Patient Data

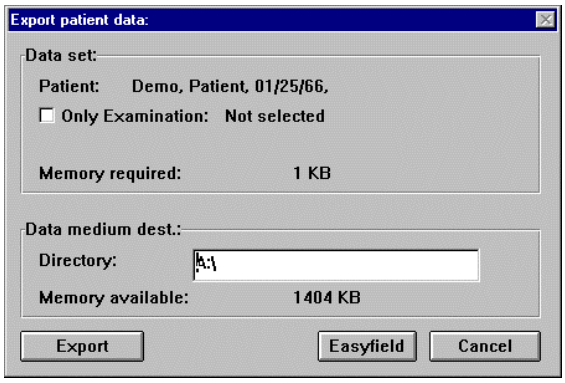
Patient data can be deleted with the **[Delete pat.]** button.

**Caution!** ⇒ This action must be confirmed twice before the data are in fact deleted, since not only all examinations but also all data for this patient are then removed irrevocably from the patient data management system.

### 8.2.6 How to Export Patient Data

This function permits patient and examination data to be transferred from the PC to another data storage medium (e.g. diskette).

Clicking the **[Export]** button opens a window which consists of two data areas:
The upper field names the data set which is to be exported, the lower field is used to identify the destination.




**The "Data set:" field**
Use this field to determine whether all examinations of the patient are to be exported or only one.
If only one examination is to be exported, select from the list of existing examinations before activating the **[Export]** button.

**The "Data medium dest." field**
Use the **"Directory"** line to enter the disk drive to which the data set is to be transferred (e.g.: "A:\" in the case of a diskette).
A subdirectory can also be named (e.g.: "A:\February\")

**"Memory required" and "Memory available"**
These two memory values show how much memory space is required for this action and how much is available on the data medium destination.

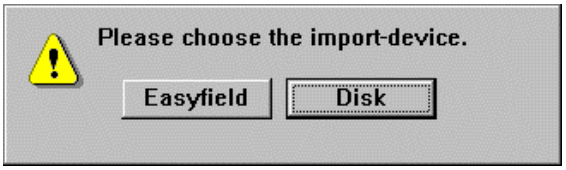
The **[Easyfield]** button can be used to send data directly to the Easyfield control unit (see 7.3.2, page 40).

Click the **[Export]** button to transfer the data set or the **[Cancel]** button to abandon this function without a transfer of data.

### 8.2.7 How to Import Patient Data

Data can be imported directly, e.g. from a floppy disk or from the Easyfield control unit.

The **[Import]** button starts this function.
The following window now opens:

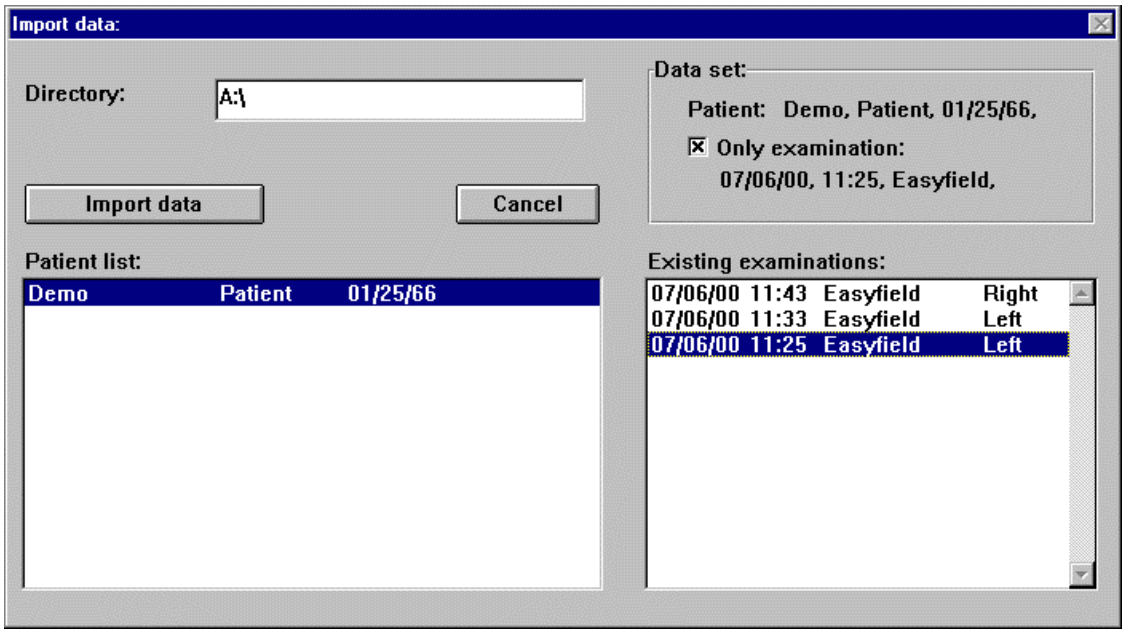



Select whether the data are to be imported from the control unit (see 7.3.1, page 39) or from a data storage medium (e.g. floppy disk).

**"Directory"**
Use this box to enter the drive designation letter and the subdirectory (if any) of the source from which the import is to take place.

A patient list displays the patients whose examinations are stored on the data storage medium. The examinations of a single patient are listed when that patient's name is selected.
If only a single examination is to be imported, click it in the list of existing examinations.

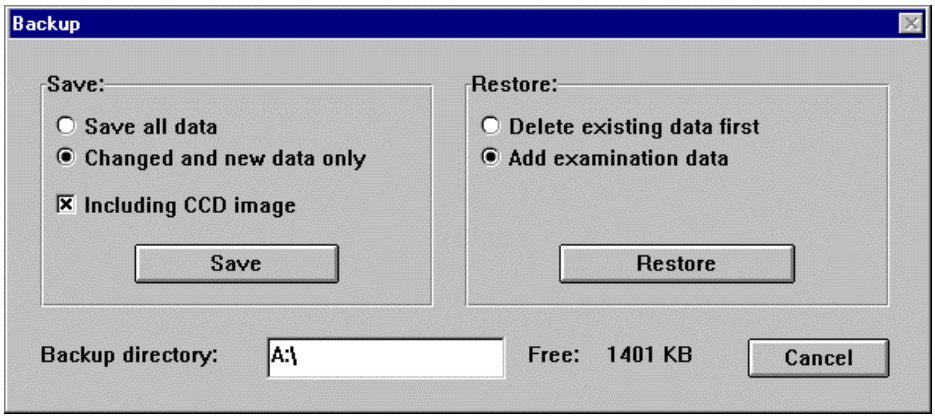
To start the import function, click the **[Import data]** button.



## 8.2.8 How to Backup Data

The **[Backup]** button opens the "Backup" window. It consists of two areas: **"Save:"** and **"Restore:"**.

Use the box below these areas to select the directory into which or from which the backup or the restoration is to take place. This may be, e.g.: "F:\" in the case of an external disk drive with exchangeable data storage media (removable hard disk).




The backup can take place according to different criteria:

- **"Save all data"** Saves all examination and patient data.
- **"Changed and new data only"** Makes a backup only of data which have been changed or created since the last backup.
- **"Including CCD image"** This function has no significance for the EASYFIELD perimeter.

**Note** ⇒ The backup may take some time, depending on the volume of data. For this reason, this function should be carried out, when the PC will not be required for a while.

Click the **[Save]** button to start the data backup.

## 8.2.9 How to Restore Data

This function restores data from the backup data storage medium to the system (PC).
Restoring from a backup data set can be carried out according to different criteria:

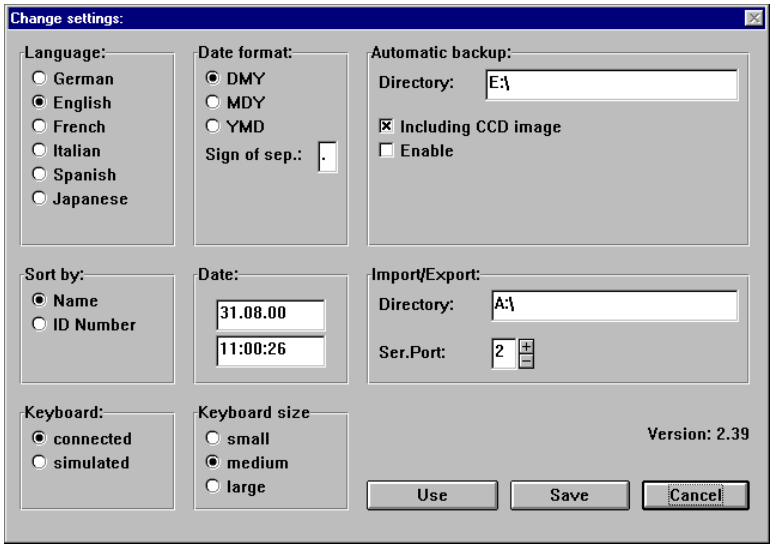
- **"Delete existing data first"**
  **Caution!** ⇒ This function deletes all presently stored examination data of the patient before restoring data from the designated data storage medium. After the restoration, therefore, only those examinations are present which are already found on the backup data storage medium.
- **"Add examination data"**
  This function adds the examination data of the backup storage medium to the already existing examination data of the patient.

Use the **[Restore]** button to start the restoration of data.

## 8.2.10 How to Change Settings

Activating the **[Settings]** button causes the **"Change settings"** menu to appear.

This can be used to adapt the patient data management system to your own preferences:




- **Language:**
  Use this function to set the language used by the program for output (German, English, French, Italian, Spanish or Japanese).

- **Date format:**
  Used to change the date display. The following sequences (with punctuation) can be selected:
  Day/Month/Year (DMY),
  Month/Day/Year (MDY),
  or Year/Month/Day (YMD)

- **Sort**
  The patient list can be sorted either by patient names or ID numbers. Sort the list by name if you customarily use patient names in searching for patients.
  On the other hand, use ID numbers if you customarily search in this way.

- **Date**
  Use this box to change the system time and date if necessary.

- **Automatic Backup**
  This function has no significance for the EASYFIELD perimeter.

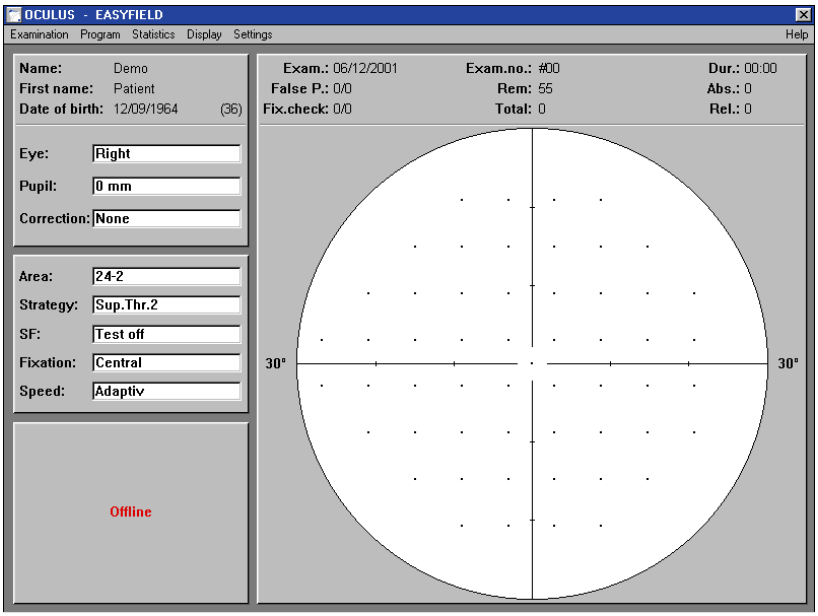
- **Import / Export**
  The backup directory in which data backup sets will be located must be selected here. This directory will then also be used as backup directory during normal backups.
  You also can set up the Serial Port where the Control Unit is connected to the PC. (ref. 7.3, page 38)

The **[Use]** button implements your choices for the continuing course of the program. However, the previously stored settings are again loaded when the program is started again.

The **[Save]** button can be used to make your choices permanent. They will then be implemented every time the program is started until they are changed and again stored with **[Save]**. The **[Cancel]** button rejects the changes without implementing them and closes this window.

## 8.3 The Examination Program

To start the examination program, select a patient from the patient list and then click the **[Easyfield]** button.
The examination program works in the same way as the control unit, except that you use the mouse for navigating (if you are working with Windows™). This chapter covers the differences between the two operating modes.




### 8.3.1 The Menu Bar of the Viewing Program

After the **"OCULUS EASYFIELD"** viewing program is loaded, the main screen appears and the pre-selected examination parameters are displayed.
The following main menu items are found in the main menu bar:

- **Examination**
  Used to carry out an examination, load already stored examination results, make printouts, and to exit from the examination program via the menu item "New Patient" (= return to the patient data management module).

- **Program**
  Use this function to select and manage pre-defined programs in order to ensure that examinations can be started as quickly as possible (see 7.2.4.6.1, page 28).

- **Statistics**
  Comparison and statistical evaluation (see 7.2.8, page 32).

- **Display**
  The following display modes are available: standard, relative, grey-scale, probability, 3D, and sectional profile (see 7.2.7, page 30).

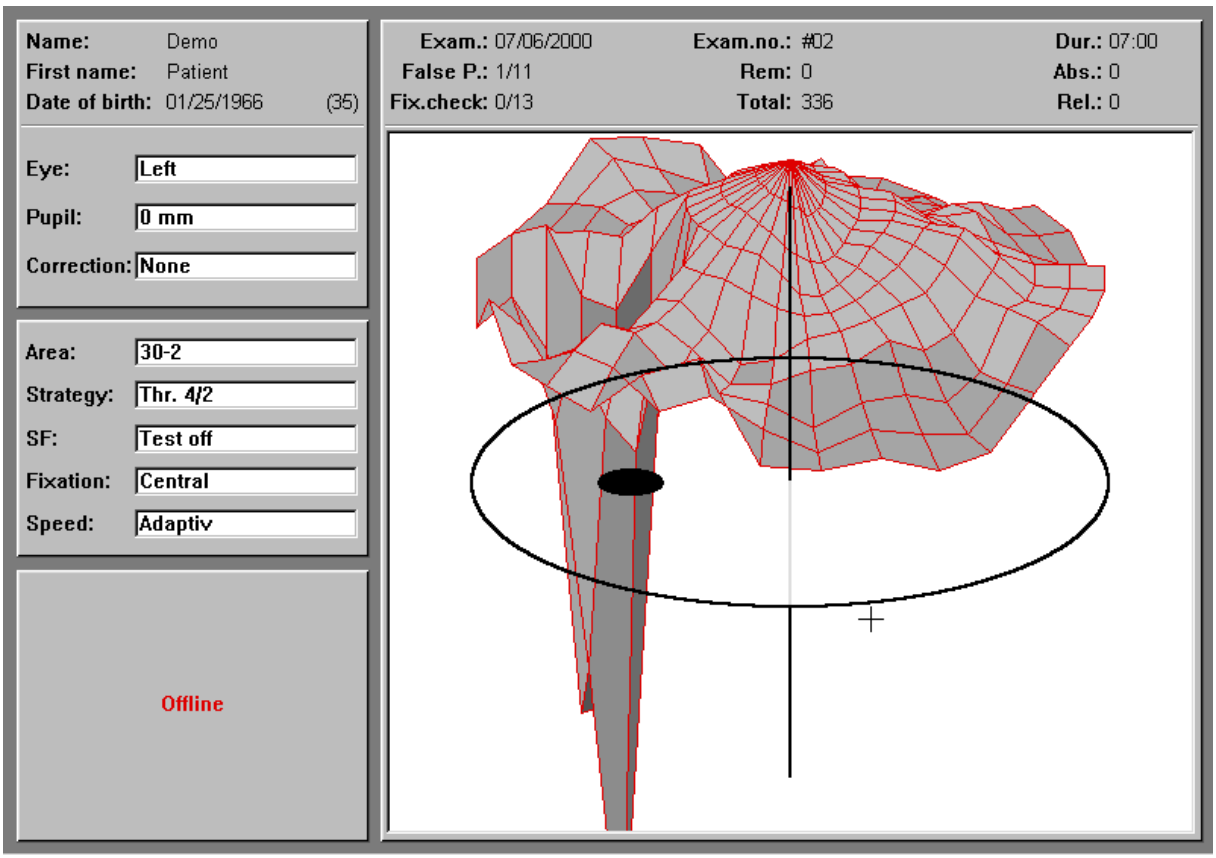
- **Settings**
  Here it is possible to select user-specific settings (language and date format).

## 8.3.2 Information Boxes

The information boxes for Patient Data and Examination Data are identical to those of the Easyfield control unit (see 7.2.3, page 25).

## 8.3.3 3D Display Mode

The three-dimensional display of the visual field hill is equivalent to that shown on the hand control unit. However, the method of moving an object is somewhat different. Click on the visual field hill and keep the mouse button depressed. Moving the mouse vertically now changes the tilt of the object, while moving it horizontally rotates the object. As long as the mouse button is kept depressed the visual field hill is overlaid by a 3D object indicating the position of the hill. The black area represents the position of the blind spot.



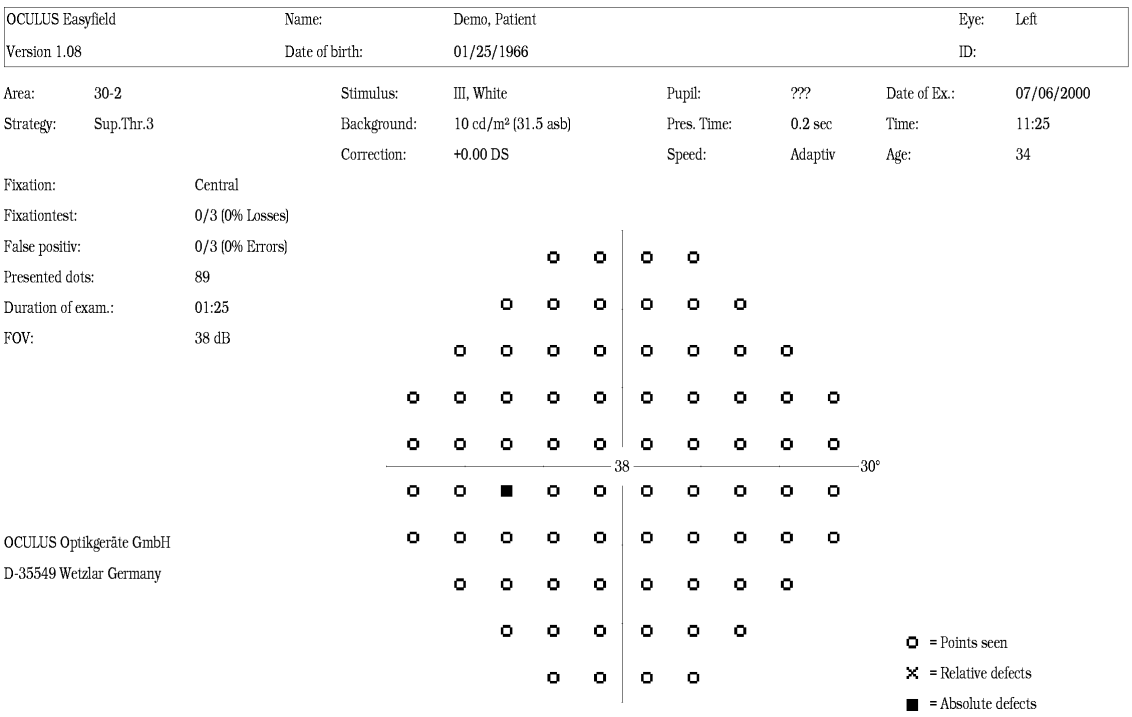

Releasing the mouse button then causes the visual field hill to be redrawn according to the recalculated angles.

## 8.3.4 Printout of Examination Results

You can create a detailed printout of the current examination results by selecting **"Examination/Print"** from the menu. This printout contains all examination data and the corresponding statistical values. You can also view this printout ahead of time on the screen by selecting **"Examination/Preview"** from the menu.
The structure of the printout varies slightly depending on the strategy which is used.

### 8.3.4.1 Sample Printout of a Supra-Threshold Examination

This printout contains not only data of the patient and the specific examination, but also a graphic image in which the points which were examined are marked on a coordinate system with symbols. These symbols are explained in a table at the lower right of the printout.



### 8.3.4.2 Sample Printout of a Threshold Examination

Six graphic images and the Defect Curve are plotted into this printout. The main graphic image (at the upper left) shows the absolute threshold values which were found; the resulting grey-scale printout is next to it to the right. The smaller printouts at the left show the deviations of the measured threshold values from the normal values for the patient's age group. - Positive numbers mean that the patient's perceptive ability is better than the norm, negative values mean that it is below the norm.

The smaller printouts on the right side show the corrected deviation, i.e. the visual field "hill" is raised or lowered in such a way that the generalized deviation is no longer visible (e.g. cataract). - The visual field defects which are now displayed correspond to local damage.

The two images at the bottom are a graphic display of the deviations which are shown in numerical form above. These numbers are translated into grey-scale symbols as follows: the darker the symbol the less likely it is that the visual field is normal at this location. As the legend at the bottom of the illustration here shows, for example, a black square indicates that the chance is less than 0.5% that this deviation will occur in a normal person.

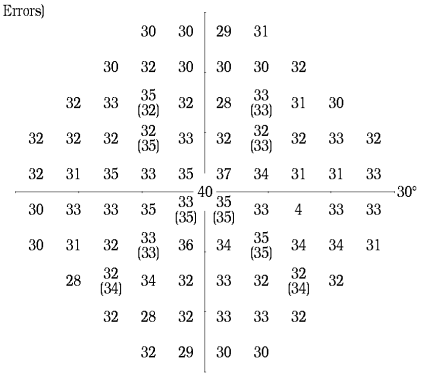
The statistical values MD (Mean Deviation), MS (Mean Sensitivity), SF (Short Term Fluctuation) and RF (Reliability Factor) are printed out on the right along with the graphic images.

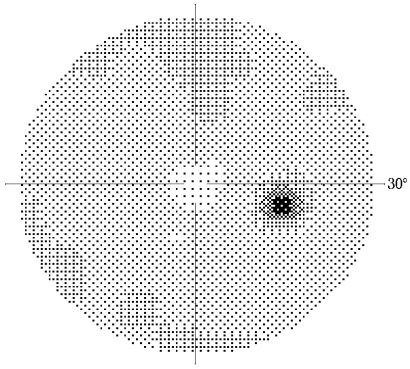
The Defect Curve is printed out at the bottom of the page.

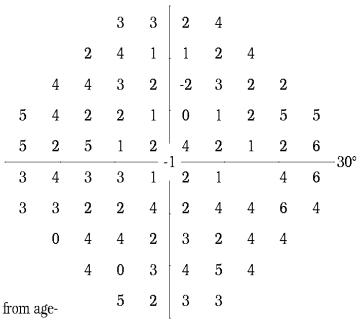
| | | | | | |
|---|---|---|---|---|---|
| OCULUS Easyfield | Name: | Demo, Patient | | Eye: | Right |
| Version 1.08 | Date of birth: | 01/25/1966 | | ID: | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Area: | 30-2 | Stimulus: | III, White | Pupil: | 5.2 mm | Date of Ex.: | 07/06/2000 |
| Strategy: | Fast Thr. | Background: | 10 cd/m² (31.5 asb) | Pres. Time: | 0.2 sec | Time: | 11:43 |
| | | Correction: | +0.00 DS | Speed: | Adaptiv | Age: | 34 |

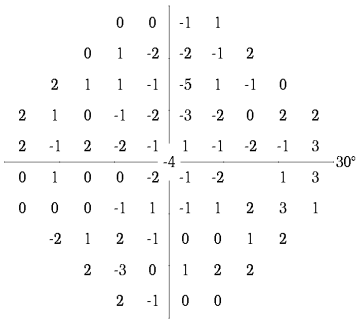
| | |
|---|---|
| Fixation: | Central |
| Fixationtest: | 0/14 (0% Losses) |
| False positiv: | 0/12 (0% Errors) |
| Presented dots: | 356 |
| Duration of exam.: | 06:56 |
| FOV: | 40 dB |



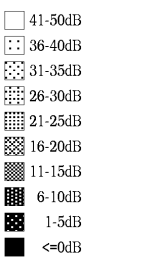



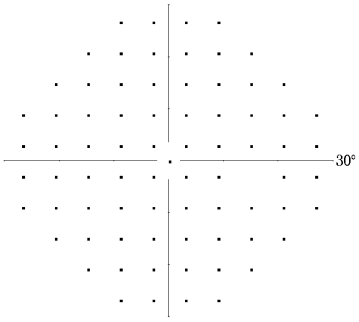

Deviation from age-related norm values

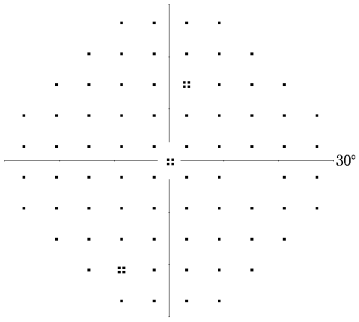



Corrected deviation




| | |
|---|---|
| MS: | 32.21 (29.36) |
| MD: | +2.85 |
| RF: | 1.00 |
| PSD: | 1.62 |
| SF: | 1.25 |
| CPSD: | 1.04 |




OCULUS Optikgeräte GmbH

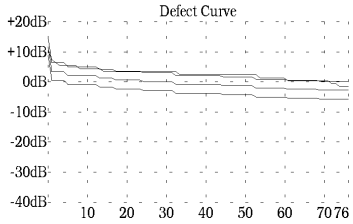
D-35549 Wetzlar Germany

:: P < 5%

P < 2%

P < 1%

■ P < 0.5%



# 9 Maintenance

## 9.1 Care, Cleaning and Disinfection

**Always disconnect the main plug before cleaning the unit!**

Do not clean the unit with agents which are aggressive, contain chlorine, are abrasive, or have sharp edges.
Always take care to observe the product descriptions and instruction manuals of agents and equipment which you use for the care, cleaning and disinfection of the unit or its accessories.

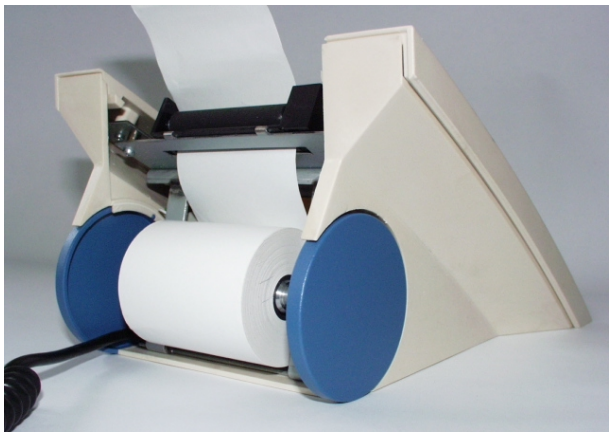
- **Cleaning the forehead rest**
  Clean these parts with soapy water (or alcohol in case of heavy soiling) and a damp, lint-free cloth.

- **Disinfection of all surfaces except those of Plexiglass.**
  OCULUS recommends
  PURSEPT®-A Disinfection cloth
  from Merz + Co
  60318 Frankfurt, Germany:
  Tel.: +49 69 1503 1
  Fax: +49 69 596 21 50
  e-mail: merzpr@merz.de

  USA: Merz Pharmaceuticals
  Phone: 336 8 56 20 03
  Fax: 336 8 56 01 07
  e-mail: info@merzusa.com

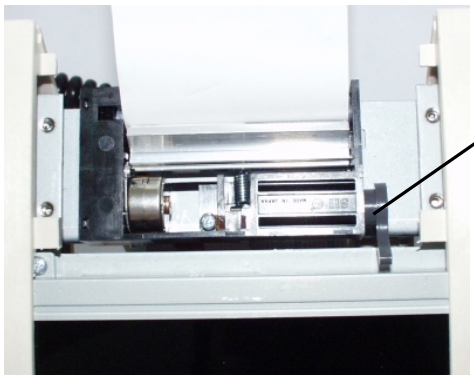
## 9.2 Inserting New Printing Paper

Switch off the instrument and open the control unit's cover above the display.



Remove the axle of the paper roll out of the holder and insert the new roll in the way that the paper is unrolled to the inside of the instrument. Put the dark grey lever at the printer in a vertical position and push the paper through coming from below. Let the paper come out of the mechanism for about 10 cm. Now put the lever back to the original position.

Insert the tip of the paper through the paper slot of the blue instrument housing and close it again.



## 9.3 Service and Service Intervals

The EASYFIELD Perimeter has been constructed in such a way that no special maintenance is required.

As a precaution, however, we recommend a check of the unit's photometric and electric values every 2 years. Please contact the OCULUS Service department for this purpose.

## 9.4 Troubleshooting

If a problem occurs which you cannot solve with the following troubleshooting table, please mark the unit "Out of order" and get in touch with our service representative.

**Never connect or disconnect a plug while the PC or the EASYFIELD Perimeter are turned on!**

| Malfunction | Possible cause | Remedy |
|---|---|---|
| No function after the main switch is turned on. | The EASYFIELD is not connected to the main supply. | Plug the main cable into the power outlet or the inlet connector for the main power on the EASYFIELD. |
| | There has been a power failure or the power outlet is not active. | Inform your electrician. |
| | The control panel unit or the serial cable of the PC is not correctly connected. | Check that the plug has been correctly connected. |
| After switching on the control unit the following message appears: **"No Perimeter connected!"** | The plug of the EASYFIELD control unit is not properly seated and screwed tight in the coupler receptacle. | Check connection, insert plug again and screw tight. Switch device off and on again. |
| | The device has been switched off and on again too quickly. | Leave device switched off for at least five seconds before switching it on again. |
| The printer does not print. | Out of paper. | Insert a new roll of paper at the control panel. |
| The printer prints red stripes. | Out of paper. | Insert a new roll of paper at the control panel |
| The Easyfield control unit does not respond when pressed. | The Easyfield control unit is not correctly plugged into the socket of the unit and screwed into place. | Check the connection, plug in the plug again and screw it into position. |
| The camera image is too dark. | The settings for camera brightness are erroneous. | Reset the brightness (see 7.2.9.1, page 34). |

## 10 Waste Disposal

The packing of the instrument is transferred to the recycling.
The metal parts will be given to the metal waste disposal. Plastic parts, electronical parts and circuits boards will be given to the electronical waste disposal.

The waste disposal must be performed according to the national legal regulations.
The corresponding waste disposal companies have to be chosen. Please ask your town/city council for the local waste disposal companies.

# 11 Terms of Warranty and Service

## 11.1 Terms of Warranty

In purchasing this unit you have acquired an OCULUS quality product.

The unit was built with care, using high-quality materials and modern production techniques.

Warranty is granted according to legislative regulations on this system, beginning from the date of delivery. This warranty includes all defects and malfunctions caused by materials or construction.

Not included in this warranty are malfunctions and defects due to improper use and outside influences.

However, should you have reason for justified complaints within the warranty period, they will be repaired without charge.

These warranty services are valid only if the bill of sale, with the date of purchase is included.

All warranty claims are cancelled if manipulations of the unit are undertaken by non-authorized persons, since considerable danger to the user and the patient can ensue from incorrect changes and maintenance.

In case of damage during shipment, please notify the shipping company at the time of delivery or immediately thereafter. Have it confirm the damage on the bill of lading, in order that the damage can be correctly processed and repaired.

Our terms of business and delivery apply in the version which is valid on the date of purchase.

## 11.2 Liability for Malfunction or Damage

OCULUS considers itself responsible for the safety, reliability and serviceability of the unit only if the unit is used in accordance with this Instruction Manual.

The unit contains no parts which require maintenance or repair by the user.

No liability whatever is possible on the part of OCULUS if assembly work, additions to the unit, readjustments, maintenance work, alterations, or repairs are carried out on the unit by non-authorized persons or if the unit is improperly cared for or handled.
If the above-mentioned work is carried out by authorized persons, these persons must certify the type and extent of their repair work, including details on changes made in the ratings or the capacities of the unit if required. The certification must bear the date on which the work was carried out as well as the name of the service company and must be signed.

If desired, OCULUS will provide authorized persons with circuit diagrams, replacement parts lists, additional descriptions, and adjustment instructions for this purpose.

OCULUS accepts no responsibility for the ability to function of the examination software running on computers which have not been supplied through OCULUS.

## 11.3 Manufacturer's and Service Address

You can receive additional information from our service department or from our authorized representatives.

**Manufacturer's and Service Addresses:**

**Germany:**

OCULUS Optikgeräte GmbH
Münchholzhäuser Str. 29
D-35582 Wetzlar
Tel.: + +49 641/2005-0
Fax.: + +49 641/2005-255
E-Mail: sales@oculus.de

**USA:**

OCULUS Inc.
P.O. Box 1007
18902 NE 150th St.
Woodinville, WA 98072-1007
Tel.: 425-867-1800
Fax.: 425-867-1881
E-Mail: oculusincusa@msn.com

**Austria:**

OCULUS Vertriebsgesellschaft mbH
A-7501 Spitzzicken 77
Tel.: + +43 33 52 22 8 –67
Fax.: + +43 33 52 33 8 – 68
E-Mail: office@oculus.at

# 12 Appendix

## 12.1 Technical Data

**Classification acc. to IEC Norm 601-1**
Type of protection against electr. shock:
Safety class I
Degree of protection against electr. shock:
Type B
Degree of protection provided by enclosures:
IP 40

**Operating conditions**

| | |
|---|---|
| Temperature | +10°C to +40°C, |
| Humidity | 30% to 75%, |
| Air pressure | 700 hPa to 1060 hPa |

**Transport- and storage conditions**
(acc. to IEC 601-1)

| | |
|---|---|
| Ambient temperature | -25° C...+70° C |
| Relative humidity | 10%...75% |
| Air pressure | 500 hPa...1060 hPa |

### Control unit

**Monitor**
Color LCD

**Storage**
40000 patients treatment in control panel and direct data transfer to PC for backup possible

**Printer**
Thermal printer

**Weight**
1.1 kg, 2.4 lb

**Dimensions**
162x228.4x113.5 mm
6.4x9x4.5 inches

### Power supply

**Input**
100 or 240 V AC
50 / 60 Hz
110 VA
0.75 A – 0.35 A

**Output**
12 V DC
2.75 A

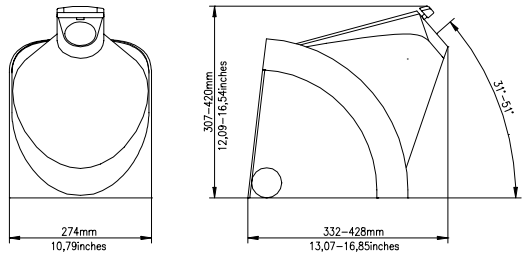
### Perimeter

**Main connection**
12 V DC

**Weight**

| | |
|---|---|
| Perimeter | 4.6 kg, 10 lb |
| Accessories | 1.3 kg, 2.9 lb |

**Dimensions (max)**
(WxDxH) 274x428x420 mm
10,79x16,85x16,54 inches




**Interface:**
RS 232 / V 24, Sub D

**Bowl radius**
R = 300 mm (virtually)

**Eccentricity**
To 30°

**Test point Ø**
Goldmann III

**Test point luminance Ls**
Goldmann 1a to 4e
continuous from 0,1 - 3180 cd/m²

**Test point color**
White

**Bowl luminance Lb**
Goldmann-10 cd/m² (32 asb)

**Background color**
White

## 12.2 Minimum PC requirements

| | |
|---|---|
| CPU: | 486 DX4 100 MHz |
| Operating system: | Windows 3.1 or higher |
| On-board memory | 16 MB |
| Graphic card: | 1 MB |

## 12.3 Declaration of Conformity

We declare in our responsibility that this product complies with the following norms or normative documents:

- DIN EN 60601-1
- DIN EN 60601-1-2
- DIN EN ISO 12866

as stipulated by Guideline No. 93/42/EEC for medical devices.

CE

*Diploma'd Engineer Rainer Kirchhübel*

Managing Director,
OCULUS Optikgeräte GmbH

# 13 Index