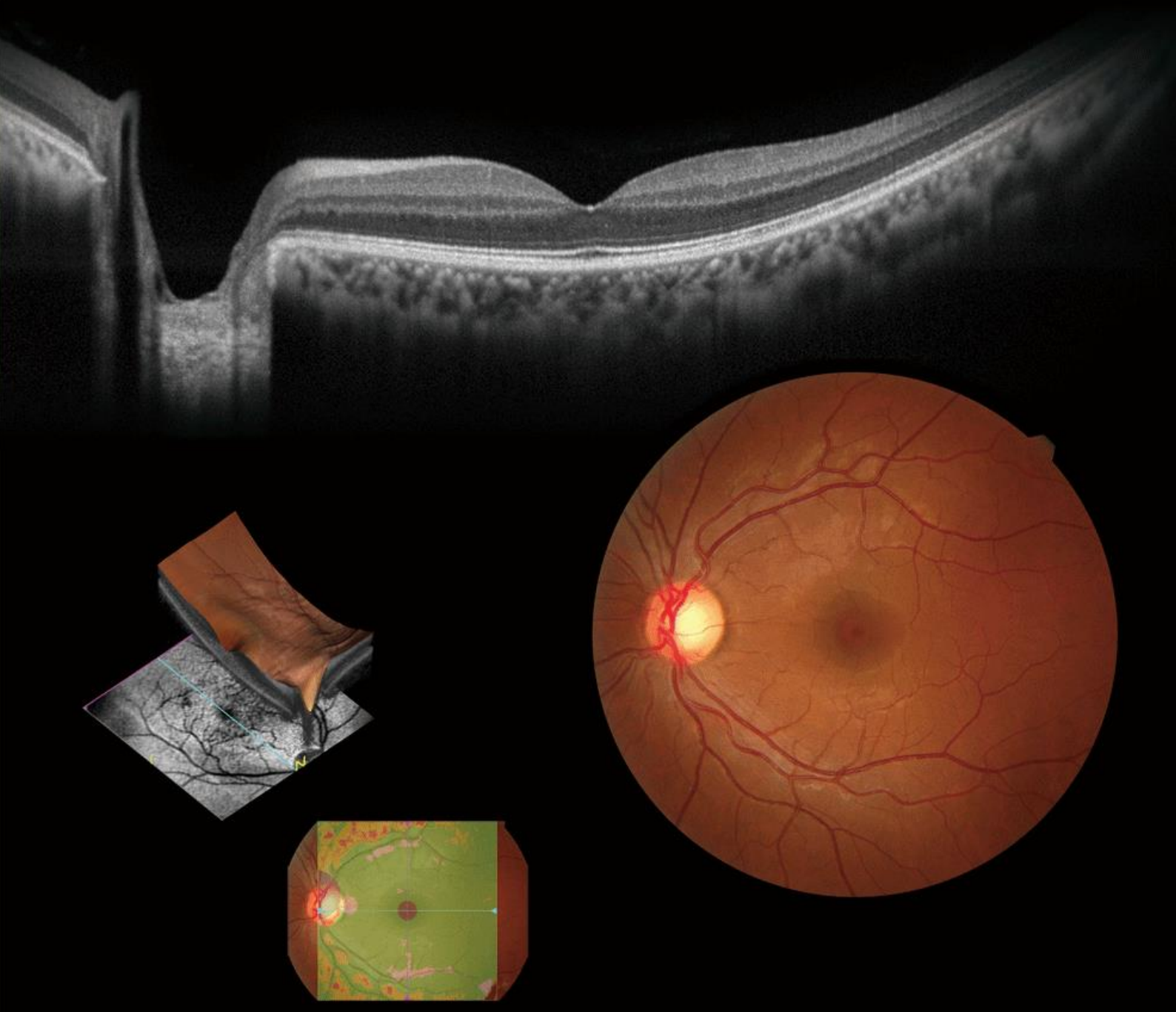
NIDEK

BIRMINGHAM OPTICAL
THE OPTICAL COMPANY

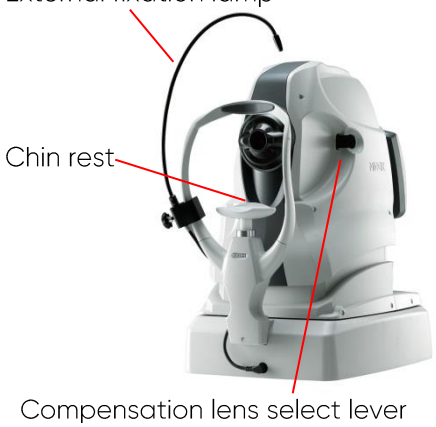
Your guide to the NIDEK OCT

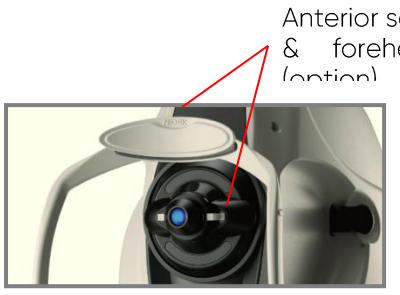


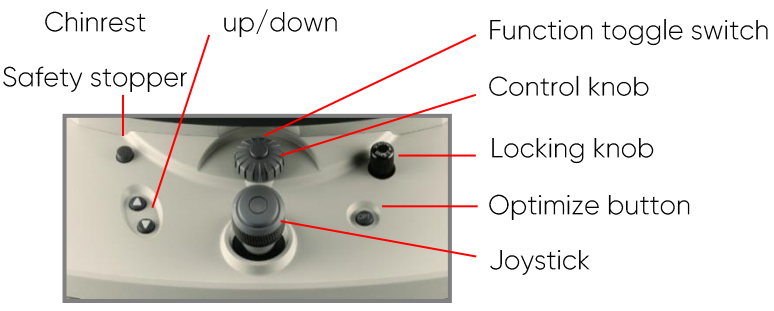
INDEX

HIGH DEFINITION OCT + FUNDUS CAMERA

RS-330 Retina Scan Duo



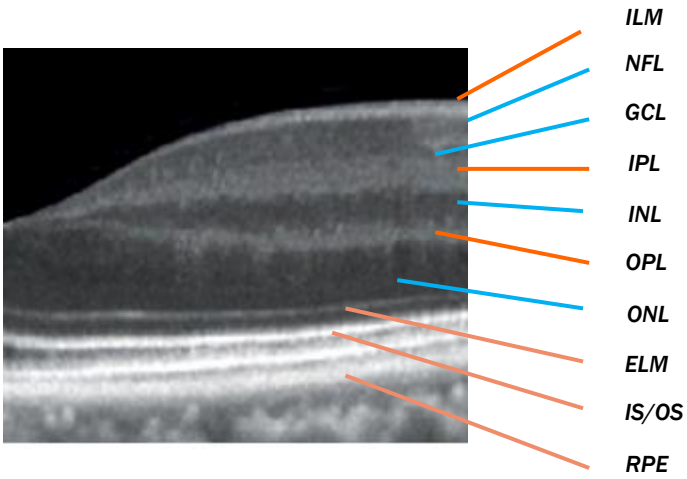




Basics of the Retina

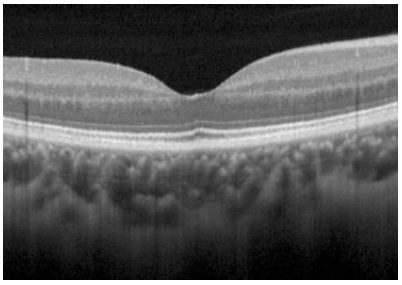
Layers of the Retina

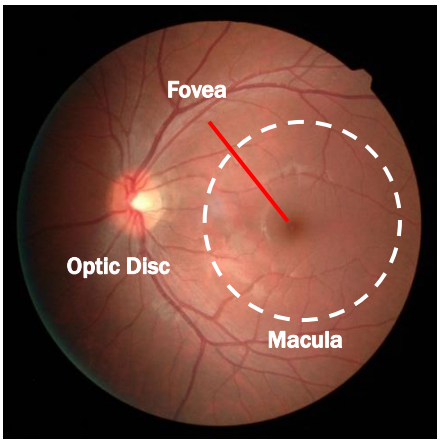
- ILM: Inner Limiting Membrane
- NFL: Nerve Fiver Layer
- GCL: Ganglion Cells
- IPL: Inner Plexiform Layer
- INL: Inner Nuclear Layer
- OPL: Outer Plexiform Layer
- ONL: Outer Nuclear Layer
- ELM: External Limiting Membrane
- IS/OS: Photoreceptors Layer
- RPE: Retinal Pigment Epithelium



Macular

- Responsible for central vision
- A radius of 3mm from the fovea; the center of the macula
- Avascular





Optic Disc

- Ganglion cell axons exit the eye to form the optic nerve at the Optic Disc
- No light sensitivity – no rods or cones
- Known as the "blind spot"
- Optic Nerve Head (ONH) carries 1 to 1.3 million nerve fibers from the eye to the brain

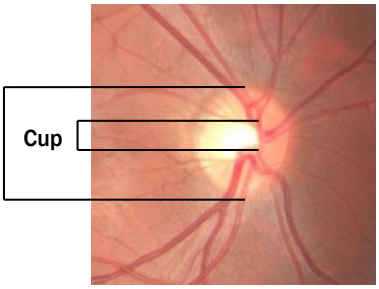
The disc can be divided into 2 areas as follows.

Disc

- Orange to pink in color
- Located about a few millimeter nasal to the fovea
- Contains nerve fibers of nerve cells

Cup

- White color
- Cup-like area in the center of the optic disc



CD (Cup-to-disc) Ratio

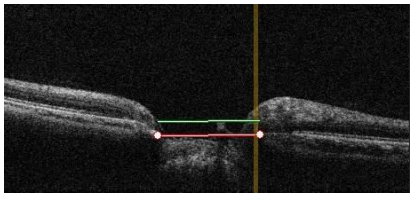
- CD = Cup Diameter / Disc Diameter
- Measurement used to help assess the progression of glaucoma
- A ratio of 0.3 or less is considered to be normal

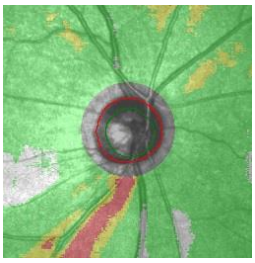
*Cupping of the optic nerve (increasing size of the cup) pushes up the ratio and may indicate damage to or loss of nerve fibers.

Normally, nerve fibers are divided into 4 areas as follows.

- Inferior (thickest)
- Superior
- Nasal
- Temporal (thinnest)

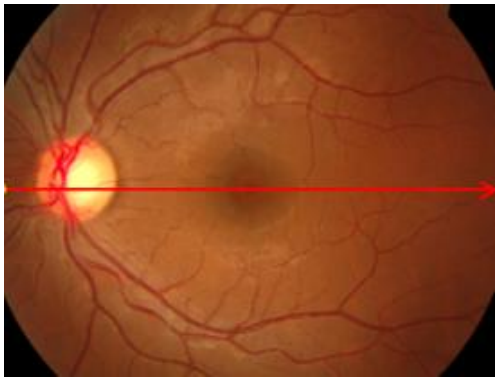
*ISNT Rule: Nerve fiber layer thickness in order

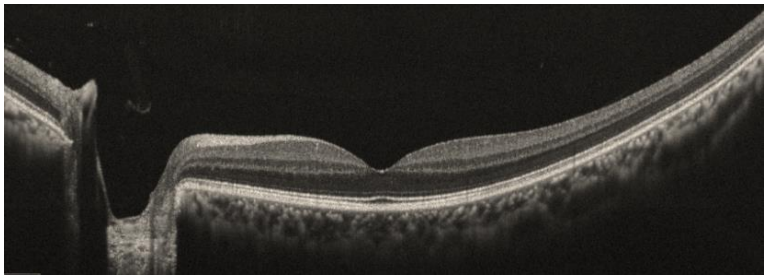




Retinal Veins and Arteries

- The central retinal artery usually emerges from the nasal side of the optic disc (left in the image below).
- Arteries are brighter red and narrower than veins-.
- Retinal vessels can be seen below on the color fundus image. They supply and drain the inner retina such as ganglion cells, whereas the outer retina such as the rods and cones and retinal pigment epithelium is supplied by the choroidal circulation.

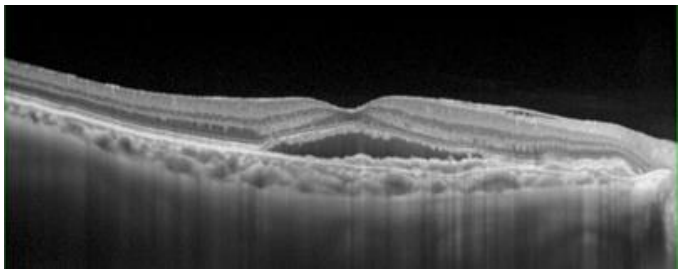




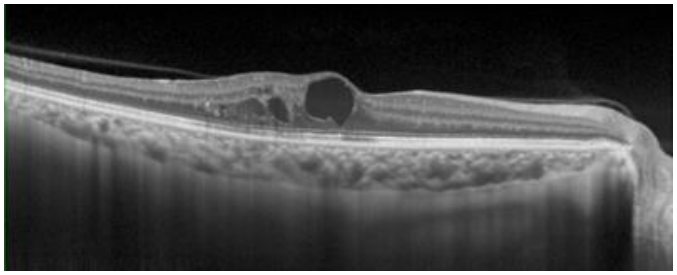
Clinical Image Samples

OCT

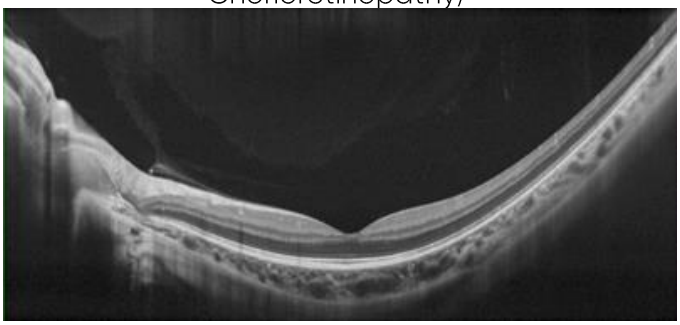
<Good Images>



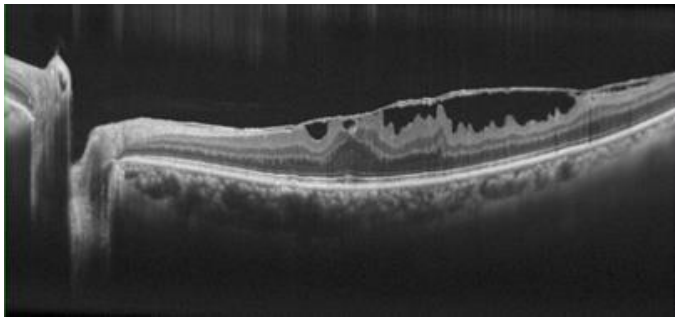
CSC (Central Serous Chorioretinopathy)



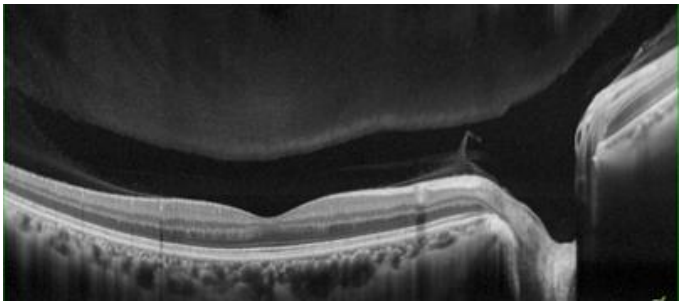
CME (Cystoid Macular Edema)



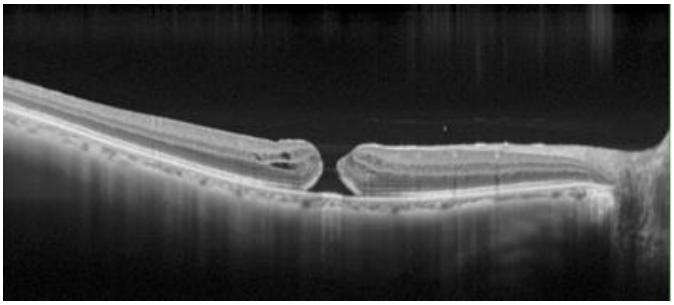
High Myopia



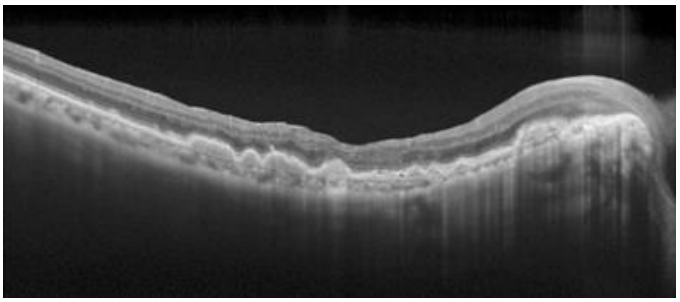
ERM (Epiretinal Membrane)



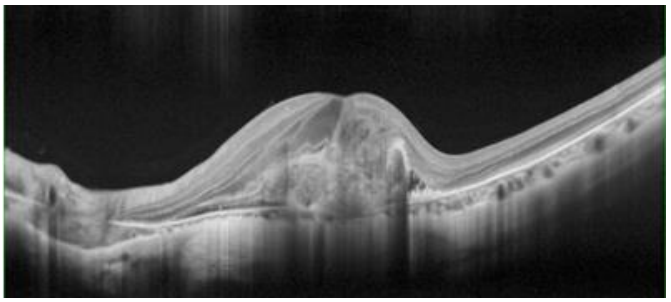
Vitreous Pocket



Full Thickness Macular Hole



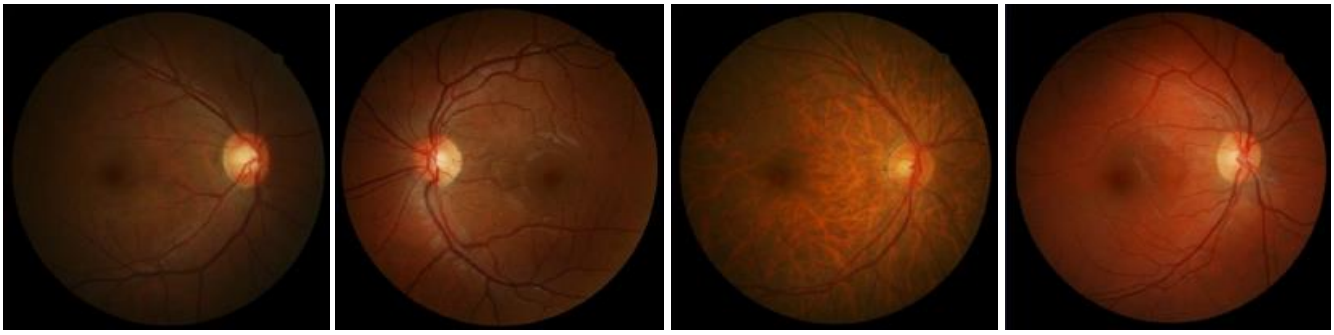
Drusen



AMD (Age-related Macular Degeneration)

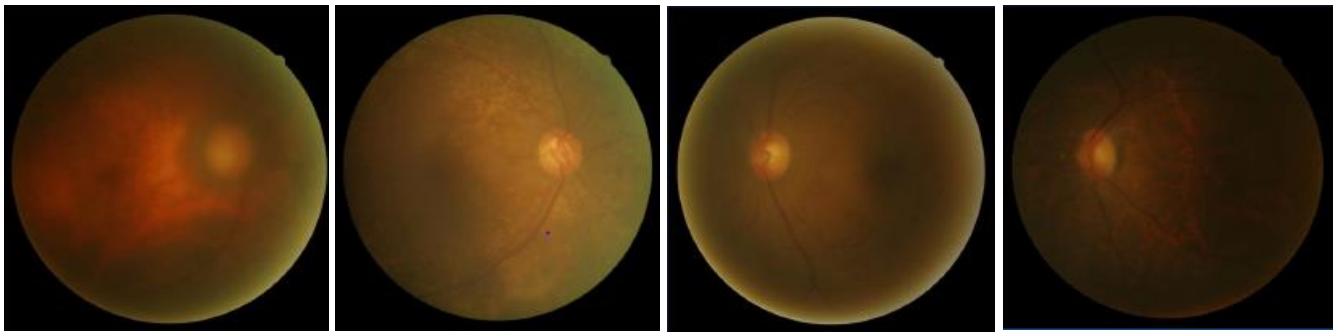
Color Fundus Photo

<Good Images>

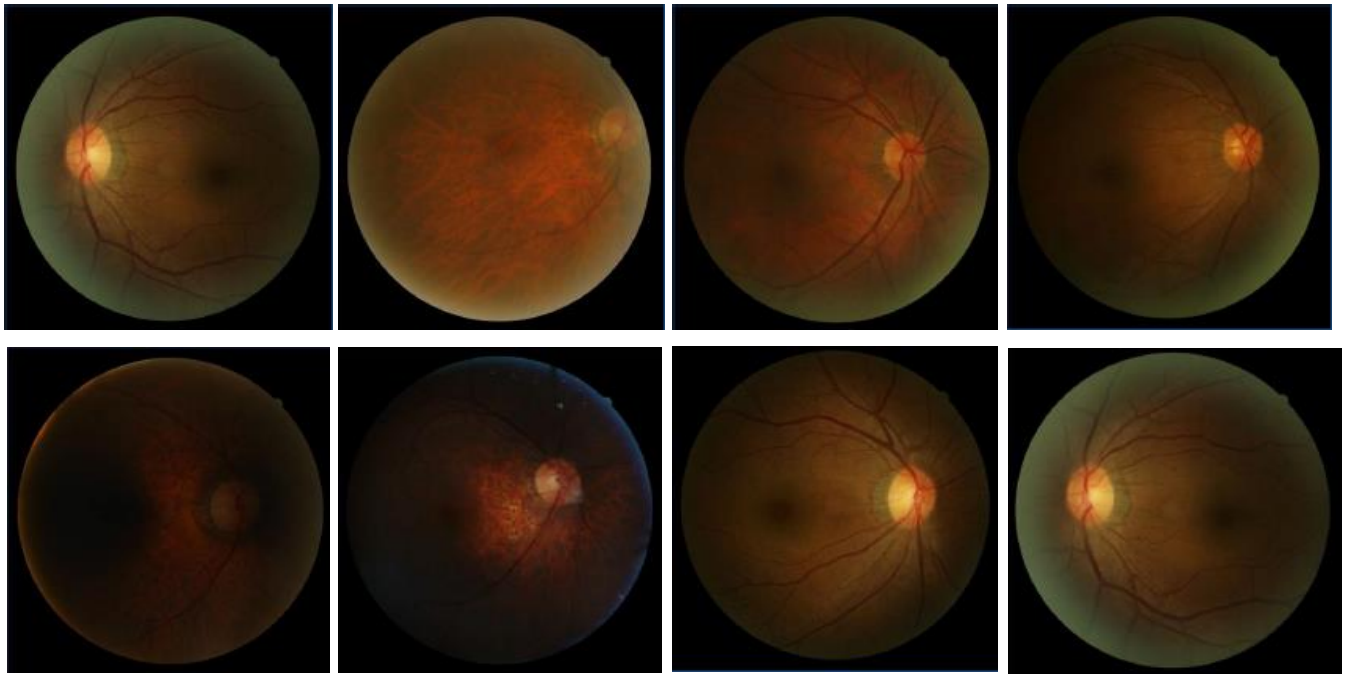


<Bad Images>

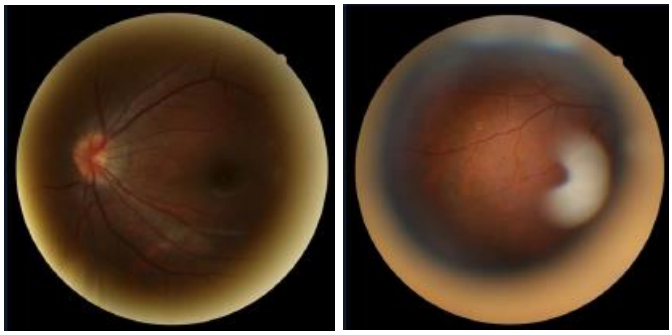
Cloudy (due to a cataract, corneal haze, vitreous floater, etc.)



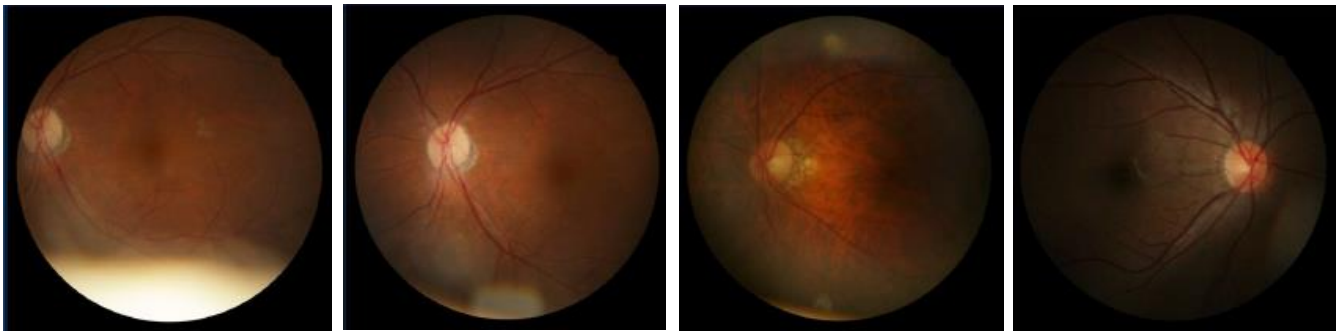
Small Pupils



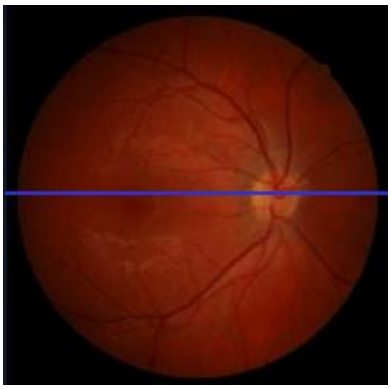
Too Close to the Eye

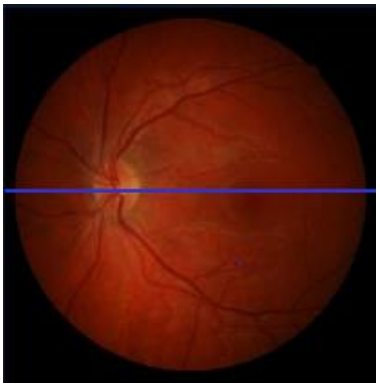


Eyelash and Eyelid Artifacts

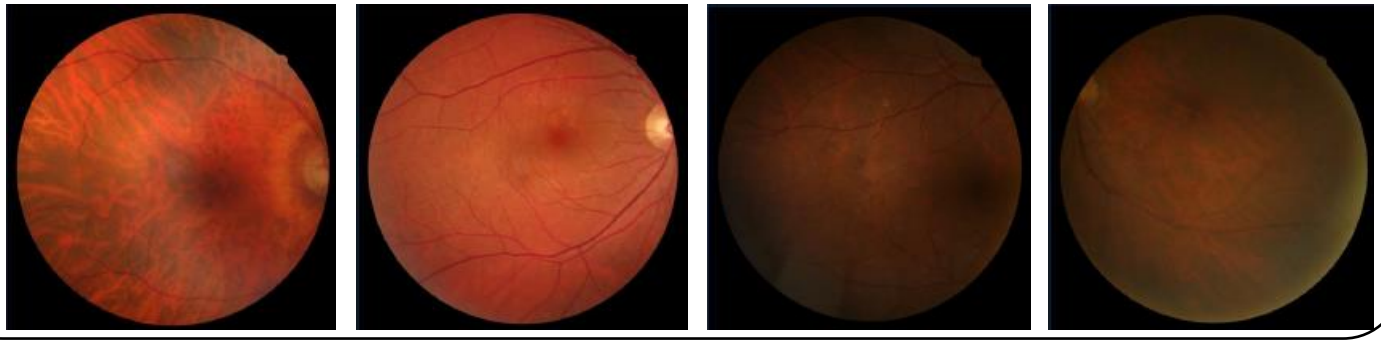


<Good Fixation>



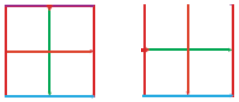
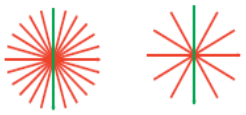
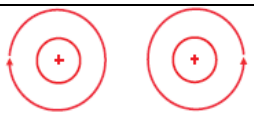
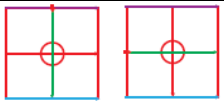
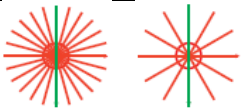


<Bad Fixation>

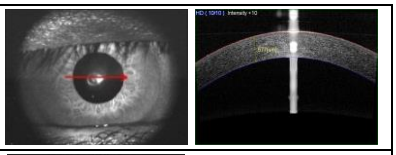
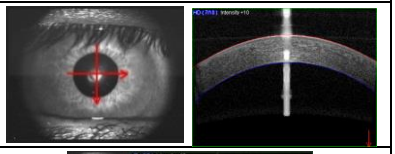
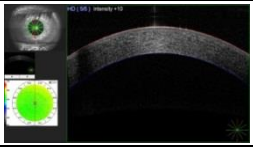
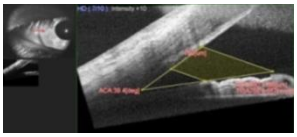


OCT Scan Pattern

<Retina - 8 types>

Macula Line	Performs a single linear scanning of the fundus to obtain OCT images.	
Macula Cross	The patient's fundus is scanned in two directions, vertically and horizontally, to obtain OCT images.	
Macula Map	In Macula Map mode, the patient's fundus is scanned vertically or horizontally for the specified range to obtain OCT images and map data.	
Macula Multi	The patient's fundus is scanned vertically, horizontally, or both along five scan lines each to obtain OCT images.	
Macula Radial	The patient's fundus is scanned along equally spaced radial lines that intersect at the center of the macula to obtain OCT images. Two scan types are provided: 12 scan lines with each spaced 15°apart from each other, and 6 scan lines with each spaced 30°apart from each other.	
Disc Circle	The patient's fundus is scanned circularly around the optic disc in the order of "Temporal", "Superior", "Nasal", and "Inferior" to obtain OCT images.	
Disc Map	The specific area centered on the optic disc of the patient's fundus is scanned vertically or horizontally to obtain OCT images and map data.	
Disc Radial	The patient's fundus is scanned along equally spaced radial lines that intersect at the center of the optic disc to obtain OCT images.	

<Option: Anterior Segment - 4 types>

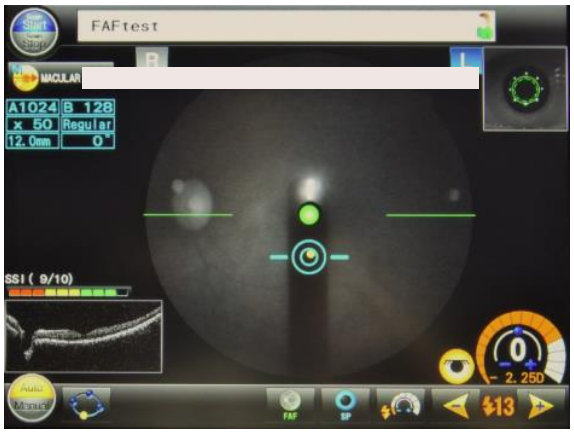
Cornea Line	Cornea Line performs a single linear scanning of the cornea. Using the measurement function, the cornea thickness can be displayed.	
Cornea Cross	The patient's cornea is scanned in two directions, vertically and horizontally, to obtain OCT images.	
Cornea Radial	The patient's cornea is scanned along equally scanned radial lines that intersect at the center of the cornea to obtain OCT images.	
ACA Line	The anterior chamber angle is scanned along a straight line.	

SETTINGS – USER SELECTABLE MODE

<Operation – 2 modes>

Standard Mode

Similar operational feeling as the conventional fundus camera, but OCT image can be provided together

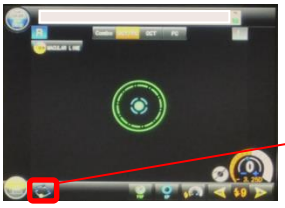


Professional Mode

Scanning position is adjustable while you check vessels or abnormal region on the phase fundus image

<How to Select>

1. Touch the "setting" icon
2. Select "Standard" or "Professional" from "Operation Mode".



<Release – 4 modes>

OCT+FC Mode

Just after OCT capturing, the color fundus image is captured with the flash light.

OCT Mode

Only OCT images (no flash for color fundus).
8 OCT settings are available.

FC Mode

Only Fundus Image (no OCT scan).
Panorama or stereo images are also available.

Combo Mode

Combination of several different scan patterns with detailed settings can be preset and registered.
(e.g.: 1st Macula Map → 2nd Disc Map / for glaucoma)

LCD monitor

NAVIS-EX

<Scan Patterns>

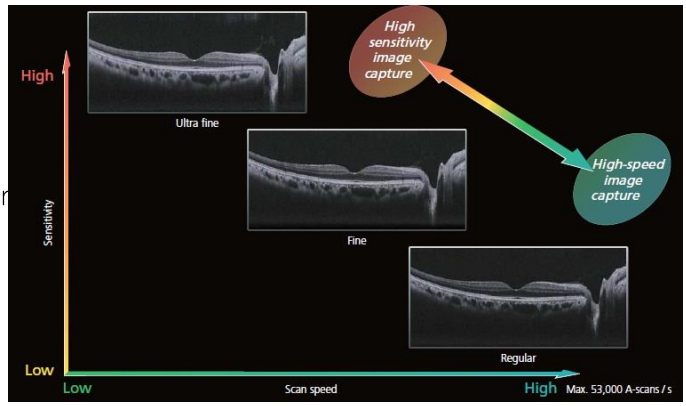
5 for macula / 3 for disc / 4 for anterior segment (optional)

→ For more details, please see page 8 "OCT Scan Pattern".

<OCT Sensitivity – 3 modes>

Regular / Fine / Ultra Fine

Selecting the OCT sensitivity based on pathology allows image capture with higher definition or at high speed.



<Auto or Manual>

Auto-Tracking
Auto-Advancement (from the anterior eye –image to fundus observation screen)
Auto-Focus & Alignment

Orange = ON
Gray = OFF

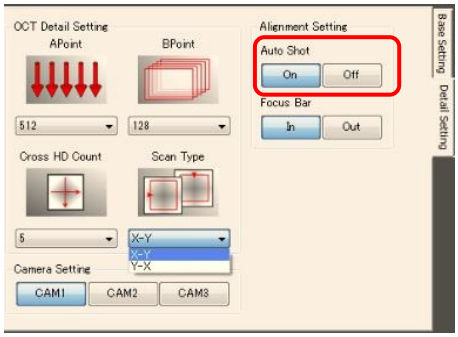
When "Auto" is on, tracking, the machine execute all the following.

Auto-Shot

From both the LCD touch-screen and NAVS-EX on the PC, auto-shot can be on and off.

LCD monitor

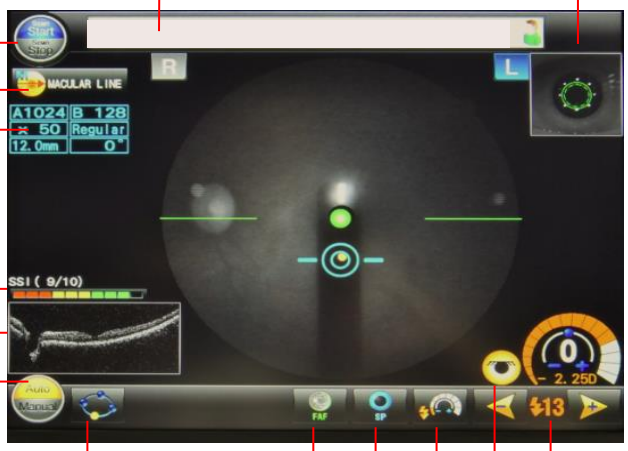
NAVIS-EX



How To Capture

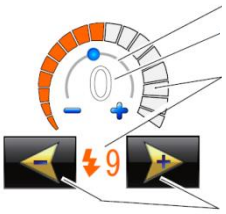
<Icon on LCD monitor>

Anterior eye image
Patient list button
Scanning start/stop button
OCT scan pattern
OCT settings view



SSI bar
OCT B-Scan image
Auto/Manual toggle button (→ see page 9)

Setting menu button
Fundus auto fluorescence toggle button
Small pupil photography mode toggle button
Low-light photography toggle button
Required pupil diameter detection mark

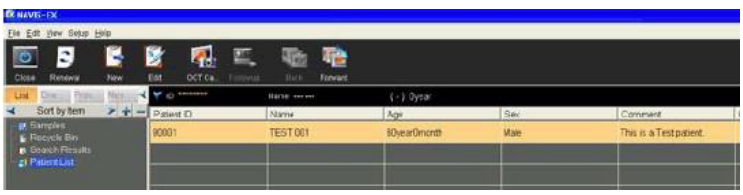


Focus gauge
Compensation lens
Flash intensity

Flash intensity Up/down button

<Preparation>

1. Remove the objective lens cap.
2. Turn on the isolation transformer power, the RS-330 main body power, and the PC power.
3. Double-click the NAVIS-EX icon on the Windows desktop.
4. Enter a user name and a password.
5. Select the patient from the list.



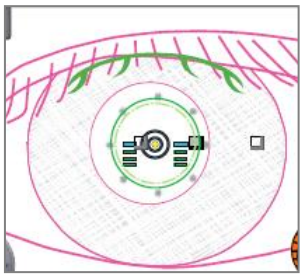
<Capturing ---- OCT + Color Fundus>

1. Click "Capture" icon on the NAVIS-EX (*PC screen)
2. Select "OCT+FC" from the release mode
3. Select the OCT scan pattern and other settings
4. Perform alignment using the joystick so that the patient's eye is displayed on the screen.
5. When the auto tracking is activated, the fundus observation screen is displayed.
   When the auto focus is activated, the optimize focus commences.
   After optimizing, the auto shot is activated.

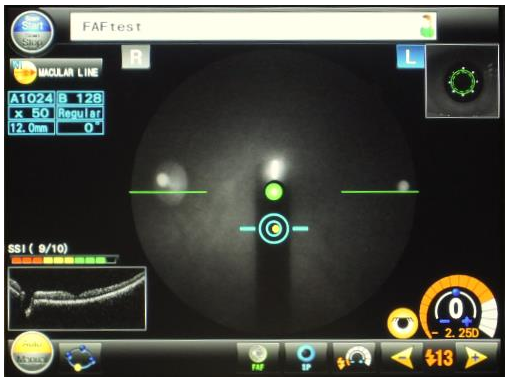
Notes:

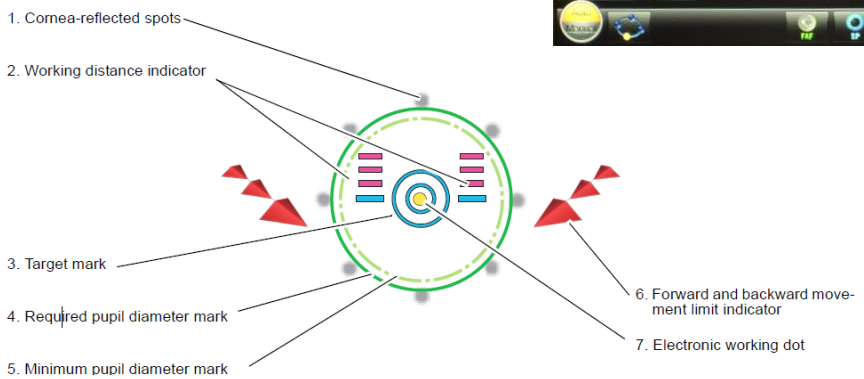
*Manual operation is available by changing the settings.
*The optimization is activated automatically when you start to capture from the anterior eye image (→ A) , but you have to press "OPT" button for optimizing when the monitor display is already switched to the retinal image (→ B).

<A>



<B>

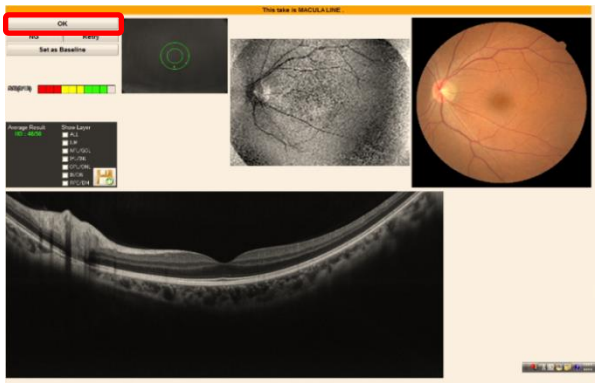




4. See the PC monitor and review the images.
   If it is fine, click "OK" icon.

Notes:

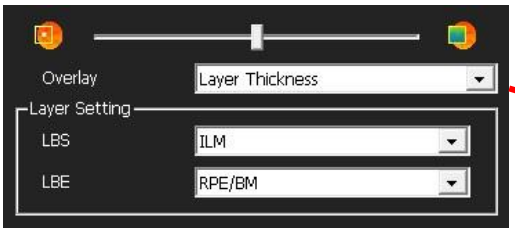
*You can zoom in on the color fundus image and see the layer segmentation on this confirmation screen before saving data.



MACULA ANALYSIS

< Overall>

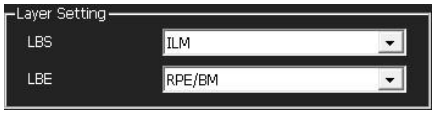
- Thickness (ILM – RPE/BM)
- Glaucoma (ILM – IPL/INL)
- ETDRS 9 Sector
- S/I Chart
- G Chart



Use to change the color level of the macular thickness

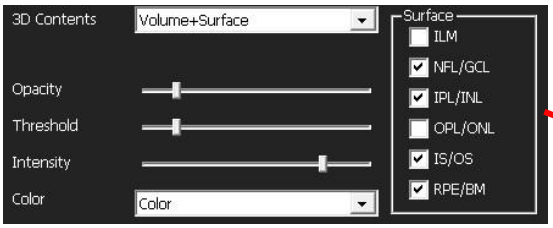
Use to switch on and off the overlay

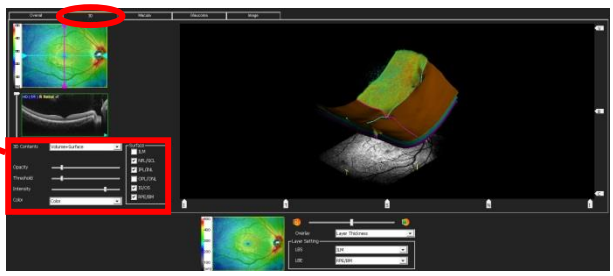
Use to select which layer range of thickness to show



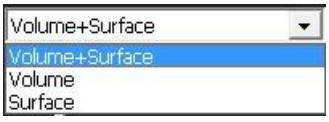
<3D>

- Three-dimensional image
- Thickness (ILM – RPE/BM)

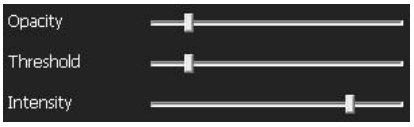




Use to select which content(s) to show on the 3D image



Use to adjust the levels of opacity, threshold, and intensity



Use to select the color of the 3D image

< Macula>

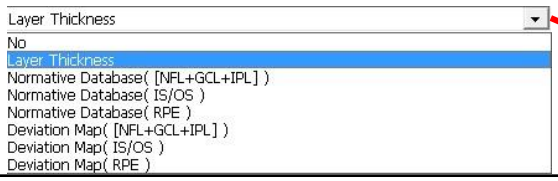
- Thickness (ILM – RPE/BM)
- ETDRS 9 Sector
- ETDRS 9 Sector Volume
- 3D layer surfaces

< Glaucoma>

- Thickness (ILM – IPL/INL)
- S/I Chart
- G Chart

< Image>

- 7 Selectable Overlays



GLAUCOMA ANALYSIS

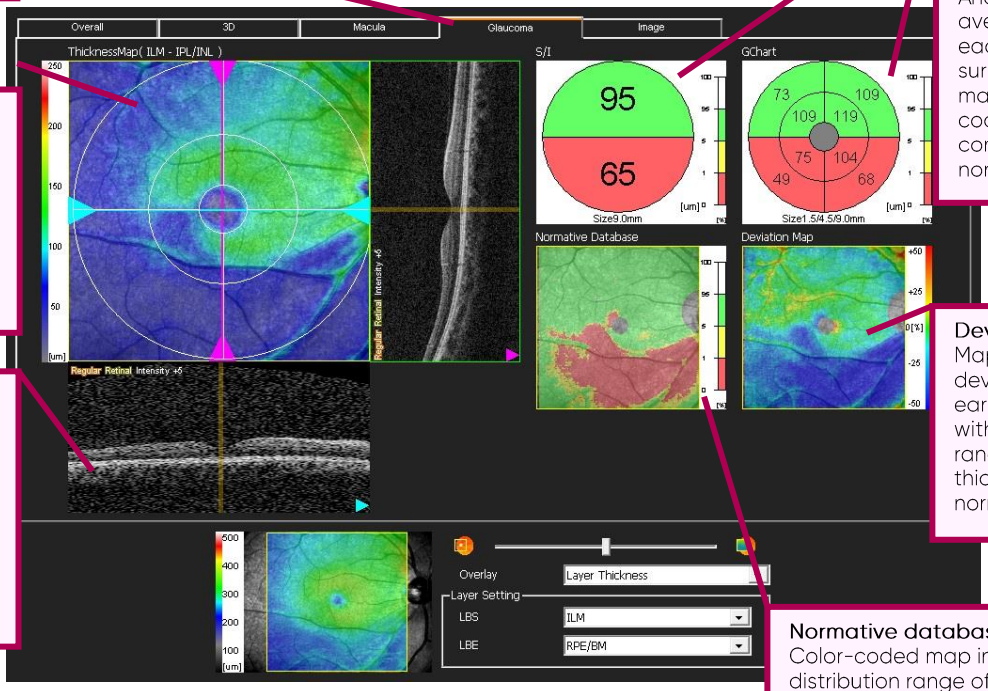
The glaucoma analysis provides the [NFL + GCL + IPL] analysis, which supplements clinical work-up for the early detection of optic nerve fiber layer defects. The 9mm x 9mm wide area map even enables analysis of the [NFL + GCL + IPL] in the peripheral retina

<Macula Map>

Analysis display switching tab

[NFL+GCL+IPL]
Color-coded thickness map (12x9mm) of [NFL+GCL+IPL] layers (ILM to IPL/INL) overlaid on OCT phase fundus image

High resolution cross-sectional image display*
*Macula map data and cross-sectional image can be acquired simultaneously with the macula map and macula cross scan

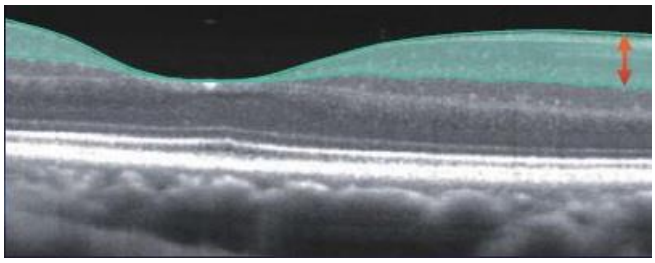


Analysis charts (Superior/Inferior pole, GChart)
Analysis charts of average thickness of each sector surrounding the macula with color code based on comparison to a normative database

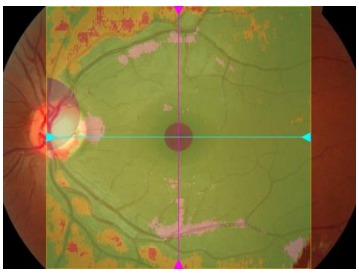
Deviation map
Map indicating the deviation, including early variation even within the normal range, from average thickness in a normative database

Normative database*
Color-coded map indicating distribution range of the patient's macular thickness in a population of normal eyes
White: More than 95%
Green: More than 5 to 95%
Yellow: More than 1 to 5%

[NFL+GCL+IPL]
The [NFL+GCL+IPL] are layers composed of Nerve Fiber Layer (NFL), Ganglion Cell Layer (GCL), and Inner Plexiform Layer (IPL).

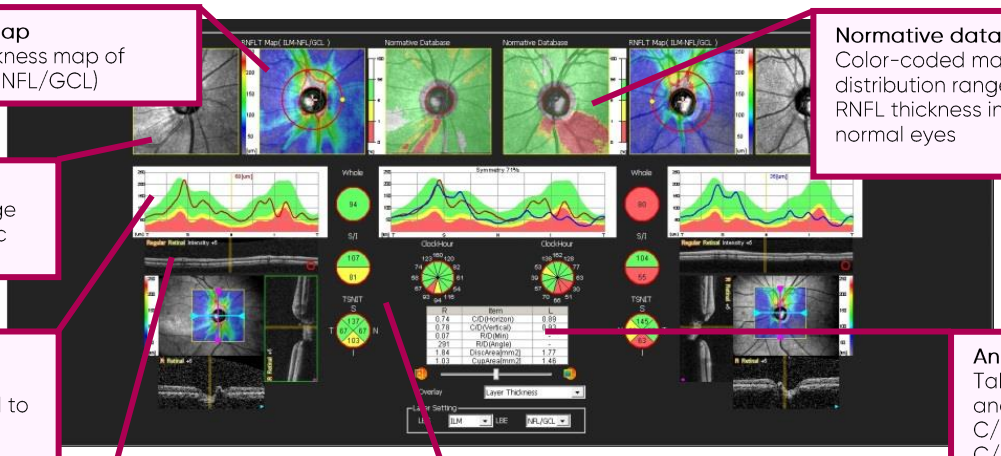


NFL
GCL
IPL



[NFL+GCL+IPL] thickness map

<Disc Map>



RNFL thickness map
Color-coded thickness map of RNFL layer (ILM to NFL/GCL)

Fundus Image*
Color fundus image showing optic disc

TSNIT graph
Graph showing thickness from ILM to NFL/GCL on disc circle with comparison to the normative database

OCT image of disc circle

Analysis charts
Analysis charts indicating average thickness of Whole, S/I (2-sector), TSNIT (4-sector), and Clock Hour (12-sector), with color code based on comparison to the normative database

Normative database
Color-coded map indicating distribution range of the patient's RNFL thickness in a population of normal eyes

Analysis table
Table of optic disc analysis
C/D ratio (horizontal)
C/D ratio (vertical)
R/D ratio (minimum)
R/D ratio (angle)
Disc area (mm_2)
Cup area (mm_2)

MULTIFUNCTIONAL FOLLOW-UP

The multifunctional follow-up allows analysis of all the data obtained with the OCT and observation of chronological change in retinal thickness and status. This function displays progression of pathology over the short term, intermediate and long-term together with a numerical value obtained from the RS-330 and other examinations such as intraocular pressure and visual field, which provide clinical information for guiding treatment.

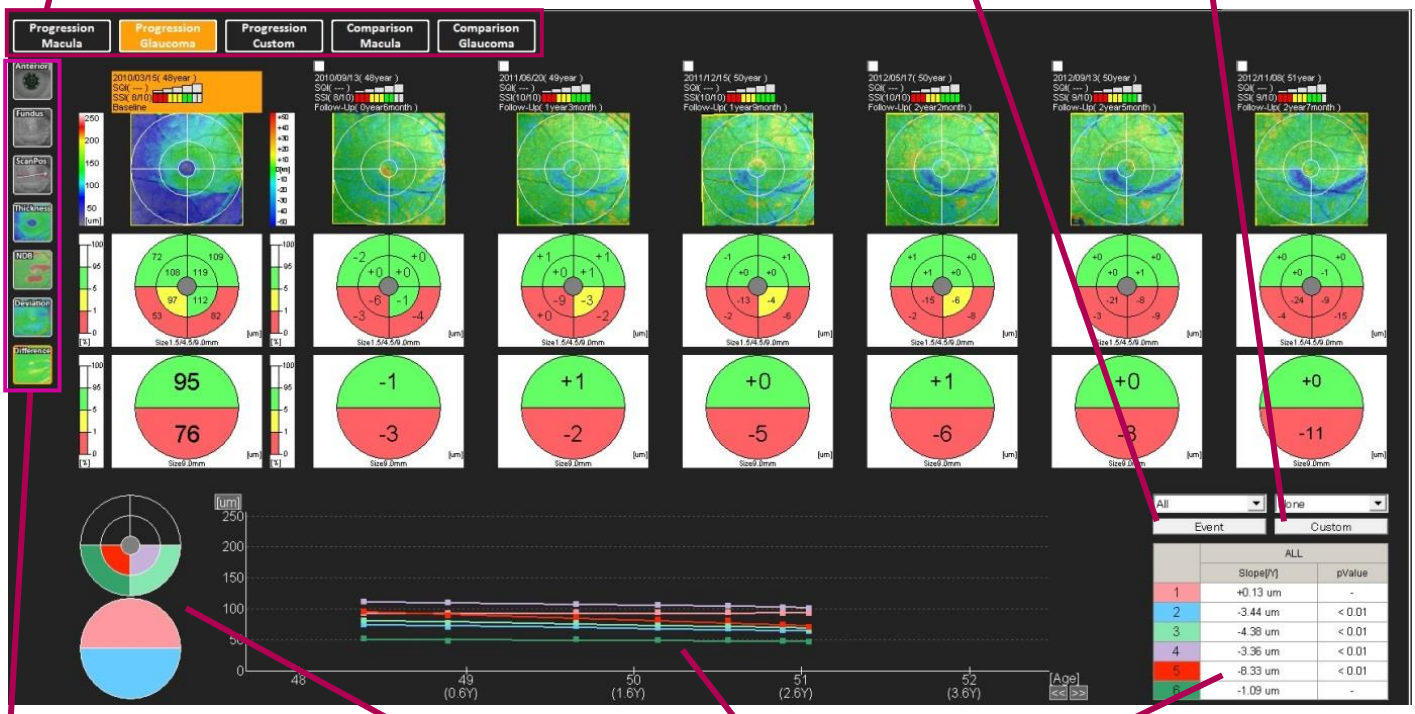
Progression mode

The progression mode performs data analysis based on the data captured up to 50 times and displays chronological change in retinal thickness with various maps, charts, and graphs for trend analysis.

Analysis display tab
Progression:
Macula/Glaucoma/Custom
Comparison: Macula/Glaucoma

Event registration
Treatment record such as start of medication or surgery can be registered and displayed.

Custom registration
Record of the numerical value such as intraocular pressure and visual acuity can be registered and displayed.



Map/Data display switching buttons
Anterior segment
Color fundus
Scan position correction color map
Normative database
Deviation map

Selection of various parameter sectors
Up to 6 different analyses can be specified.

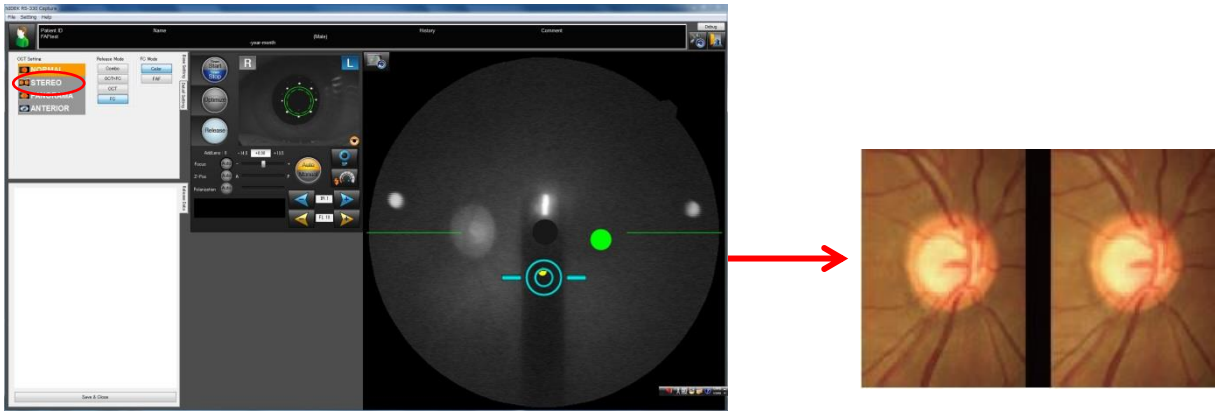
Graph indicating trend of retinal thickness

Graph analysis of retinal thickness trend
Slope and p-value of each graph

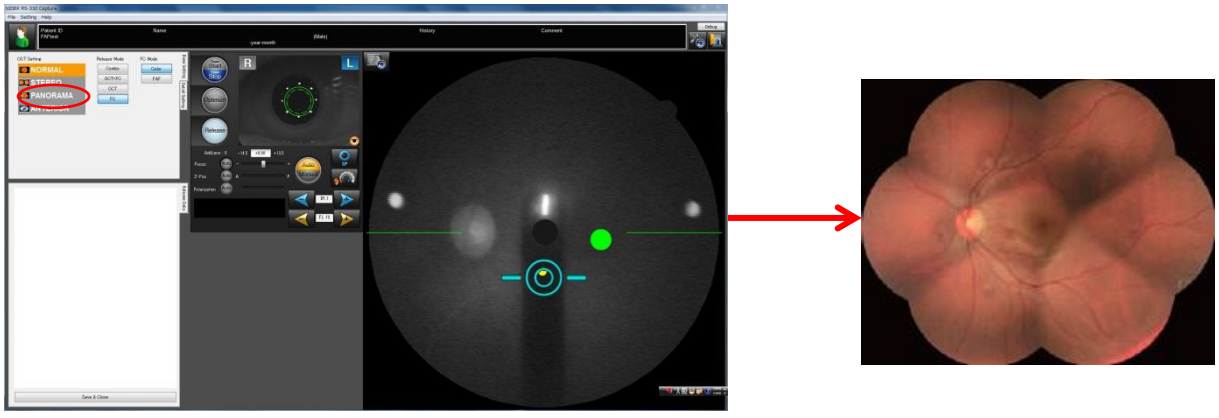
STEREO & PANORAMIC PHOTOGRAPHY

The RS-330 navigates stereo and panoramic photography with target marks displayed on an observation screen, which enables an operator to easily capture stereo images and the image series for a panoramic composition*.
*Stereo image observation and panoramic composition are available with the NAVIS-EX software.

<Stereo mode>



<Panoramic mode>



How to compose stereo image

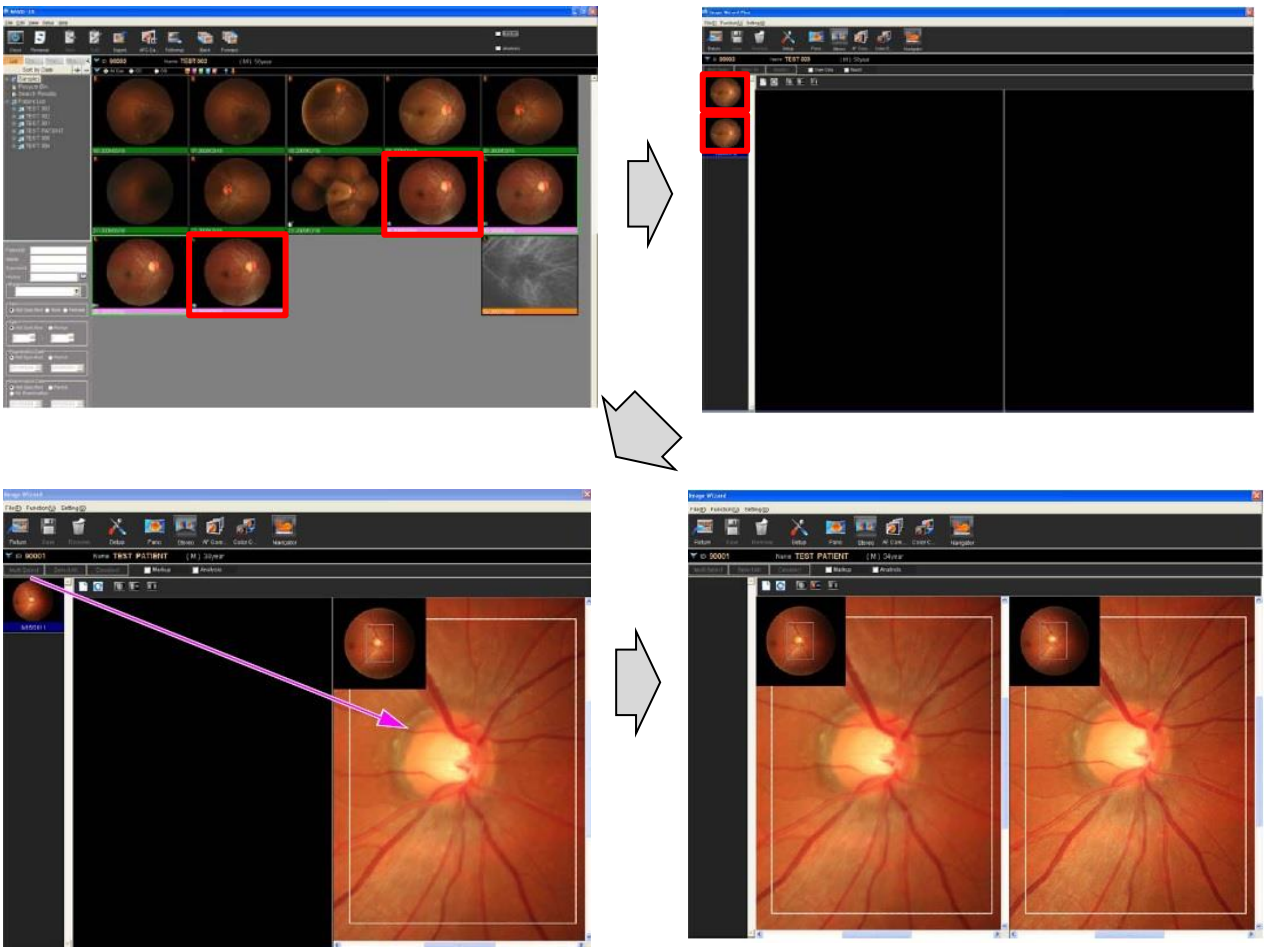
This mode is used to capture two fundus images: one at 1mm away to the temporal side from the fundus center, and the other at about 1mm away to the nasal side from the fundus center.

1. Select the pair image captured with the Stereo function.
2. Go to 'View', 'ImageWizard', and 'Stereo'.
3. Click the Stereo button  switch to the Stereo screen.

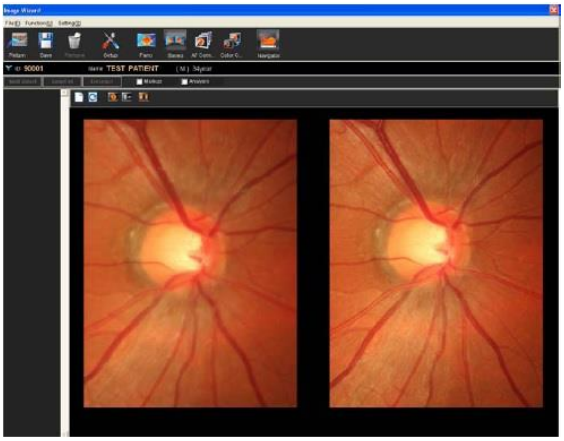
   Note:

   When an image is first selected for stereo image, the image is automatically assigned to the workspace when switching to the Stereo screen.
4. Drag the thumbnail image to arrange to the workspace.
5. Adjust the position and the size of the image.

Left-click on the image	Moves the right-and-left image to center the clicked position and, the image expands at the same time.
Right-click on the image	The right-and-left image moves to center the clicked position and the image reduces at the same time.
Drag	Moves the one side image. This is enabled only when the image is displayed extended off the white frame line.

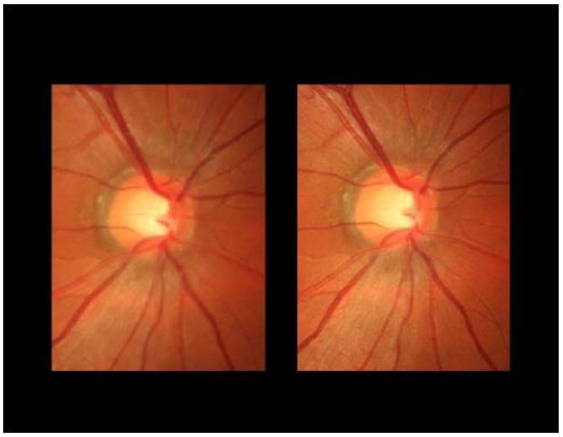


6. Click the Proceed button.
   The stereo image is displayed compounded.
   If the image position needs to be fine adjusted, drag the image.
   To change the image display magnification, click the Return button to return to Step 5.

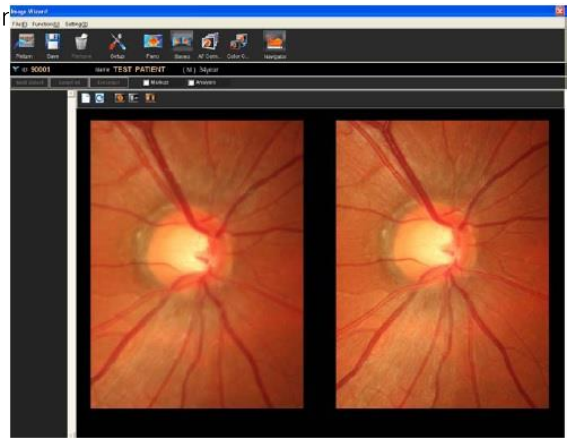


7. Use the stereo viewer to perform stereo observation.
   During observation, perform fine adjustment to the image position as necessary.

   1) When displaying the stereo image with full-screen, click the Full-screen button.



   2) Use the stereo viewer to perform stereo observation.
   Clicking the mouse returns to the screen in which the tool is displayed.

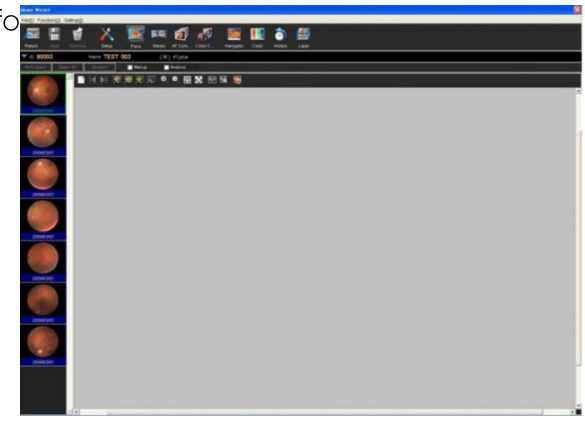


8. When saving the compounded stereo image, click the Save button.
   Clicking the Return button saves the stereo image and return to the Patient List screen.

How to compose panorama image

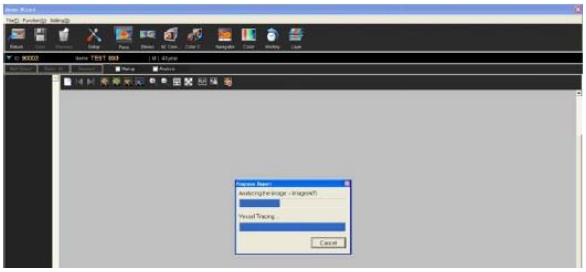
The Panorama function produces simulated wide-angle fundus images by overlapping multiple fundus images captured at different angles.

1. On the Image List screen, select the image to perfo the Panorama Image Composite.

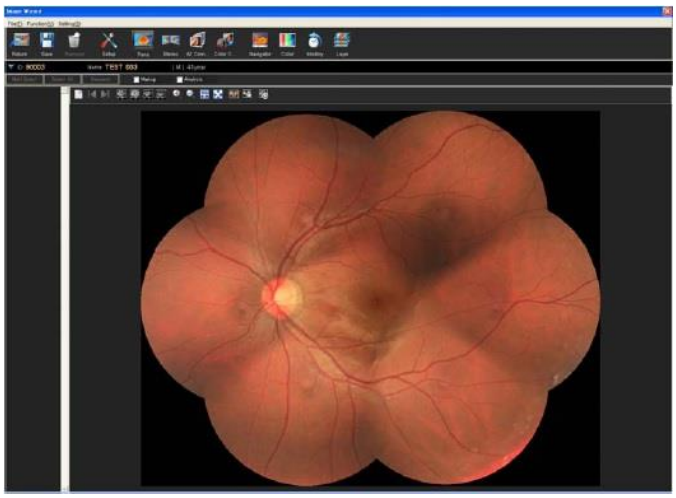


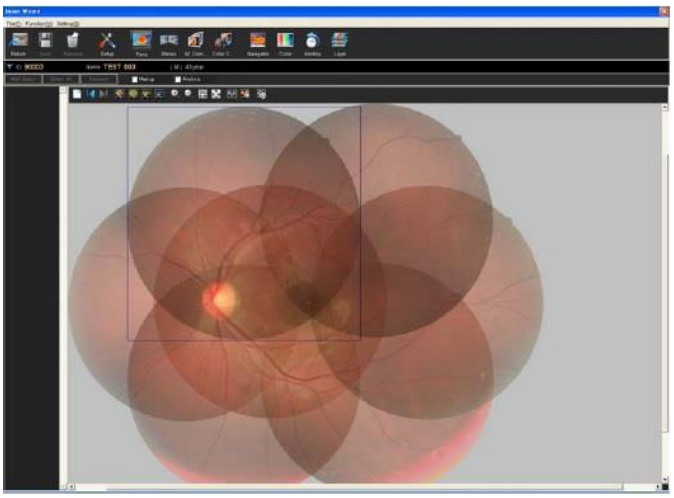
2. Click 'View', 'Image Wizard', and 'Panorama' to enter the Image Wizard screen.

3. Click the Auto buttor in the tool bar.
   Auto Panorama Image Composite is started and a progress bar dialog box appears.
   It may take a few minutes to complete processing.
   To stop processing, click the Cancel button in the dialog box.

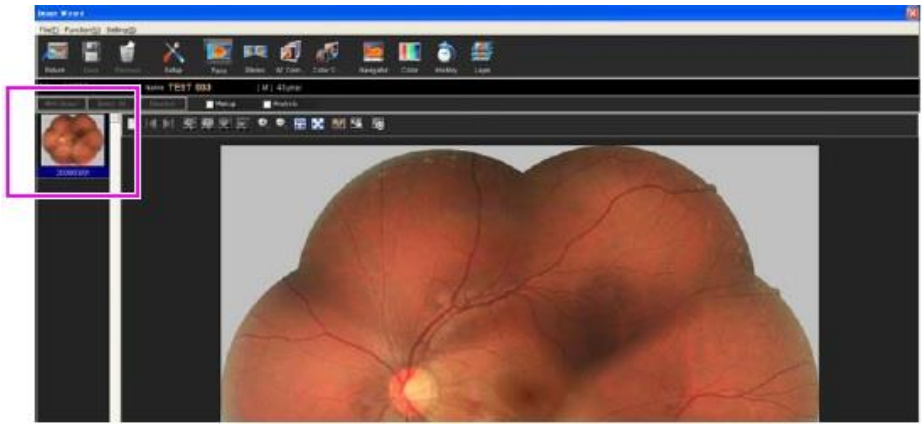


4. When the processing is completed, the Progress Report dialog box closes and the Panorama image is displayed.
   After completing the Panorama Image Composite, if the Return Workspace ton is clicked, images used for the composition are released composition of the workspace with the current arrangement.
   Each image can be adjusted.





5. Click the Save butto in the toolbar.
   A save confirmation message is displayed and click the Yes button to save the Panorama Composite Image as new image.



6. When the Return butto is clicked, save the Panorama image and return to the Patient List screen.

TROUBLE SHOOTING

<For Capturing>

1. Floaters

- So-called myodesopsia
- Get the patient to blink a lot or move their head

2. Dense Cataract

- Never image directly at a cataract as light will bounce back
- Try to move the capture point up and down or right and left within the pupil
- Try to select the "Ultra Fine" mode
- Ask a patient to move their fixation away from the center, and then look back at the fixation lamp.
- Take a Map scan first and move the line to the fovea

3. Small Pupils

- Make sure the patient is not accommodating
- Ask them to look into the distance
- Scan in a darkened room
- Use drops if necessary

4. Dirty Lens

- If all your scans are poor, check that the lens is clean
- Clean according to the manual

5. Poor Central Vision

- Use optic disc to aid alignment
- The optic disc should be at the right of the fundus image screen when capturing a right eye and vice versa
- To make this easier click on the fundus view magic wand and select "show alignment"

6. After Vitreous Surgery

- Cannot capture well
- Adjust the diopter to about -25D and use the "Ultra Fine" mode

<Recommended Setting>

7. What's the best scanning area for MAP?

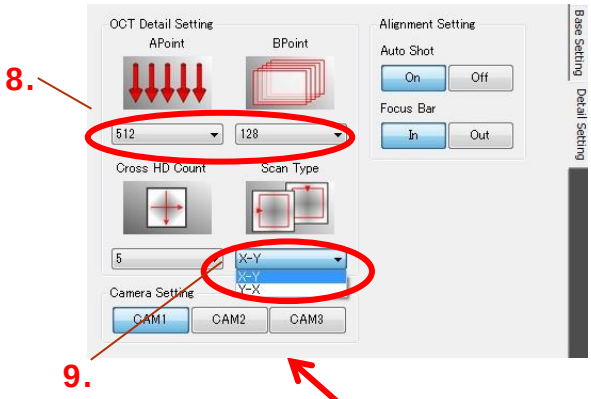
- 9mm for Macula Map
- 6mm for Disc Map (9mm when needed)

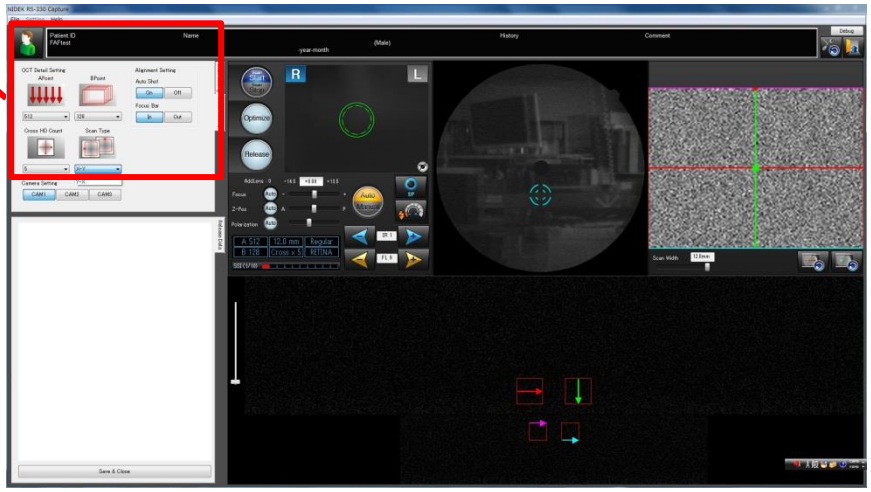
8. Taking too much time for capturing disc map and macula map. What should I do?

- Change from "256 x 256" to "512 x 64" regular mode or "256 x 64" fine mode
  Disadvantage: Phase fundus image gets harsher. (*see the Image below)

9. Which scanning direction is better, X-Y or Y-X?

- Y-X is recommended for Glaucoma, PACG and etc.
  Why? → Suited for disorders needing observations with S/I comparison
- X-Y is recommended for AMD or macular disorders
  Why? → Less vessel shades and easier to see





10. Any tips for using different modes, Regular, Fine and Ultra Fine modes?

- Regular Mode : If your priority is the speed
- Fine Mode : If your priority is a balance of speed and quality of image
  Ultrafine Mode : If your priority is the high quality of the image

<Caution>
Macula diagnosis values the COST line and the brightness of Ultra Fine mode could make it less clear

11. Which produces a better image, Regular HD10 or Fine HD5?

- The higher the SSI, the more image quality affected
  → Fine HD5 provides a better image. (SSI: see page 10 & 31)

12. How do I know whether the examination went well or not?

- Macula/disc is placed in the center with the SSI level over 7.
  (SSI: see page 10 & 31)

13. What should I do when Macula MAP is not captured well?

- Check if the position and the image of macula were appropriate
- Change the scanning area width to 6mm or if multi, change it to macula cross and explain how to move the capturing locations
- Double-check after capturing an image on the screen
- Let the users know the results could change upon staff's level of skill and understanding and suggest them to hold study meetings if needed

14. What should I do when Disc MAP is not captured well?

- Basically, most OCTs have the same problem because patient's visual fixation on nasal is very difficult and morphological change have an influence on disc image
- If the patient's visual fixation is the biggest problem, try capturing quickly
- Place the retinal surface in the right place when capturing an image
- Looking through the patient's medical records for understanding the patient, helps to acquire the right results

15. No problem with fixation, but line is slightly away from fovea

- Try small fixation lamp or ask patient to look at the center of fixation lamp
- Check if capture line is in the center of fixation lamp after alignment. Then, if capture line is not on the center, ask service department to fix the alignment

<For Analysis>

16. Which retinal layers should I measure for retinal thickness?

- The RS-330 defines retinal thickness as the thickness between the ILM and RPE. However, if you prefer thickness between ILM and IS/OS, you can change by changing settings.

17. Why are there Disc Circle and Disc Map modes? Can they both be used for glaucoma diagnosis?

- Typical main scan pattern for glaucoma diagnosis is Disc Map. Disc Circle can be captured quicker and is easy to use so it's suited for glaucoma screening. If a follow-up might be needed for the patient, Disc Map is recommended. Both scan patterns can be used for software analysis.

18. Can C/D ratios be measured?

- Yes (it is displayed under the overall tab). However, the C/D area ratio is not shown (The areas of the disc and cup are displayed so manual calculation is possible). RS-330 calculates C/D ratios of both the horizontal and vertical lengths and R/D ratios.

Item	Value
C/D(Horizon)	0.48
C/D(Vertical)	0.64
R/D(Min)	0.12
R/D(Angle)	116
DiscArea[mm2]	2.32
CupArea[mm2]	0.77

19. What functions are there for disc analysis?

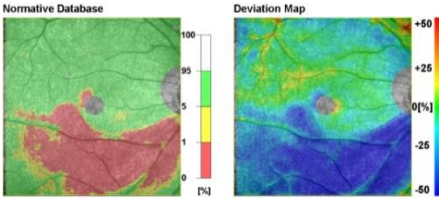
- C/D ratios and R/D ratios are the main analysis. As for Disc Map, RNFL analysis is necessary as well.

20. Why do map images on the map analysis screen have so much noise?

- They are the areas not captured due to the blinks of the patient.

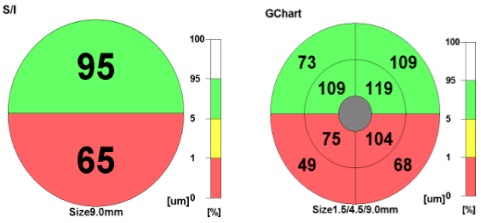
21. What's the difference between the NDB and Deviation Map?

- Deviation Map is a more detailed version of the NDB. It shows how deviated the retinal thickness is to normal eyes in % using a wide range of colors, whereas the NDB uses only 3 colors to indicate if the thickness is normal, or thin, or greatly thin.



22. Why use G-chart?

- G-chart helps to find glaucoma at early stages by showing retinal thickness divided to Superior and Inferior. Glaucoma normally starts from either Superior or Inferior areas and the G-chart takes account of this characteristic glaucoma progression.

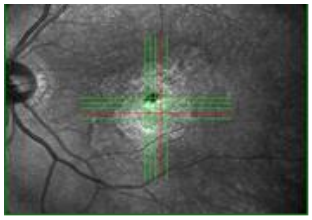


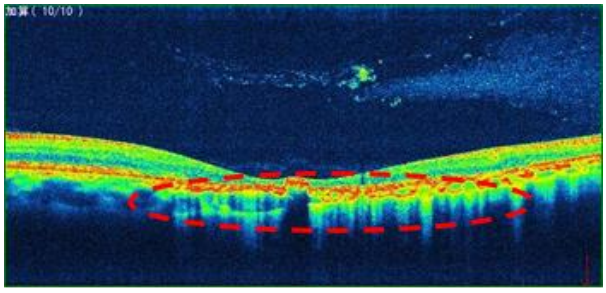
23. What is an Artifact?

- Artifacts tend to appear on the OCT image under some conditions (Some of main causes are listed below). Please refer to the examples below

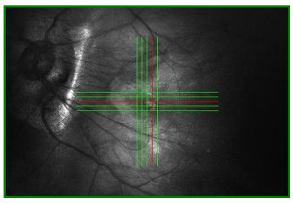
Main causes:
Acoustic Shadow, Excess Penetration, Eye movements or Blinks, Scan Position Gap

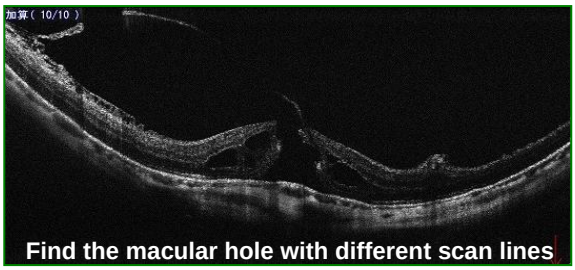
Highly reflective areas due to atrophy:





Scanning line dislocated (macular hole):





<Fundus Camera>

24. What should I do if a red dot appears in the middle of the image?

- This artifact appears with specific refractive errors (-15) due to the structural characteristics of the optical system. All existing fundus cameras have the same problem.

25. Why can't the disc be captured with zoom?

- Setting "x2" in the CAM setting enables you to capture a 2 X magnified image. Please make sure to adjust the fixation light.

GLOSSARY

<Abbreviation List of Diseases>

AMD	age-related macular degeneration	NVD	neovascularization of disc
BRAO	branch retinal artery occulusion	NVE	neovascularization elsewhere
BRVO	branch retinal vein occlusion	NVG	neovascular glaucoma
CF	counting fingers (Low vision)	PAS	peripheral anterior synechiae
CFB	corneal foreign body	PBK	pseudophakic bullous keratopathy
CME	cystoid macular edema (oedema)	PDR	proliferative diabetic retinopathy
CNV	Choroidal neovascularization	PED	pigment epithelial detachment
CRAO	central retinal artery occlusion	POAG	primary open angle glaucoma
CRVO	central retinal vein occlusion	PPA	peripapillary atrophy
CSR	central serous retinopathy	PPDR	preproliferative diabetic retinopathy
DME	diabetic macular edema (oedema)	PVD	posterior vitreous detachment
EKC	epidemic keratoconjunctivitis	PXF	pseudoexfoliation
ERM	epiretinal membrane	RAPD	relative afferent pupillary defect
GCA	giant cell arteritis	RD	retinal detachment
IOFB	intraocular foreign body	RK	radial detachment
KPs	keratic precipitates	TRD	tractional retinal detachment
NPDR	non-proliferative diabetic retinopathy	VH	vitreous haemorrhage
NTG	normal tension glaucoma	VSR	venous stasis retinopathy

<General Words for OCT & Fundus Camera>

OCT

A Scan
The A-scan is obtaining information to form an OCT image for a single line in the Z axis direction

B Scan
The B-san is obtaining information to form an OCT image for multiple Z-axis lines scanned in the X and/or Y directions (parallel to the fundus).

FAF
FAF stands for Fundus Autofluorescent. FAF enabled you to record the fluorescence that may occur naturally in the eye helping diagnose the retinal diseases such as AMD or diabetic retinopathy.

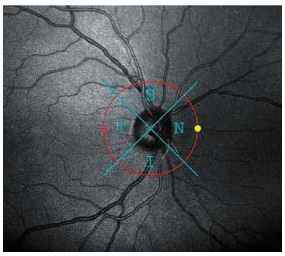
OD
Oculus dexter (Right Eye)

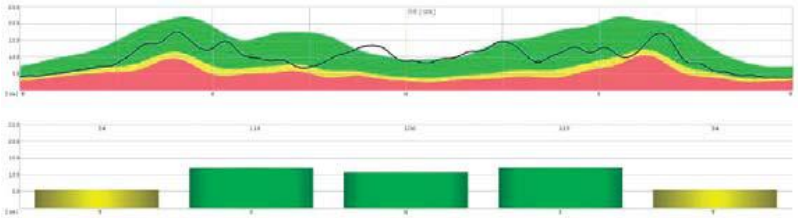
OS
Oculus Sinster (Left Eye)

OU
Oculi uniti (Both Eyes)

NDB
Color-coded map indicating distribution range of the patient's [NSL+GCL+IPL] thickness in a population of normative eyes.

TISNT
TISNT stands for Temporal, Inferior (Lower Side), Superior (Upper Side), Nasal (Nose Side), Temporal (Ear Side).





C/D ratio
C/D ratio stands for cup-to-disc-ratio. The higher the C/D ratio, the higher the probability there is Glaucoma. For more details, please refer to trouble shooting No. 18 (page 25).

S/I chart, G-chart
S/I shows the thickness of the retina, and chart is divided into superior and inferior. The G-chart is divided into smaller areas than S/I allowing users to be able to check more details. For more details, please refer to the trouble shooting No. 22 (page 25).

ACA
Anterior Chamber Angle

AOD
Angle Opening Distance

ACD
Anterior Chamber Depth

TISA
Trabecular-iris space area

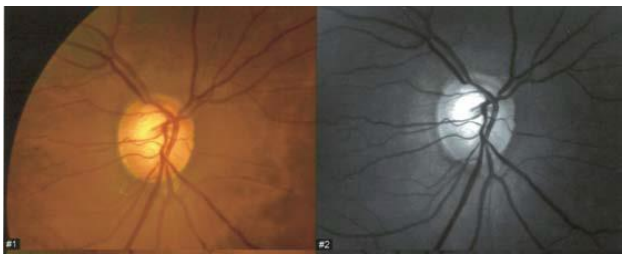
Fundus Camera

Alignment
- Indicates moving the image capturing unit to the optimum position for image capture. The alignment is performed twice: one in the anterior eye observation screen and the other in the fundus observation screen.

Panorama photography mode
- Used to capture panoramic funds images. The desired two to nine images can be captured and arranged

Red free

Fundus Photo Red Free



Small pupil photography mode
- Used for image capture of eyes whose pupil diameter is smaller than the requirement but larger than 3.3 mm in diameter. In this mode, a little amount of flare may be captured on the peripheral area.

Stereo photography mode
- Used to capture two fundus images: one at about 1 mm away to the temporal side from the fundus center, and the other at about 1 mm away to the nasal side from the fundus center.
- The two captured images can be viewed stereoscopically using the stereo viewer on the image filing software NAVIS-EX.

<Terms for RS-330>

ACA LINE
- The anterior chamber angle is scanned along a straight line.
- Available only when the anterior segment module (optional) is used.

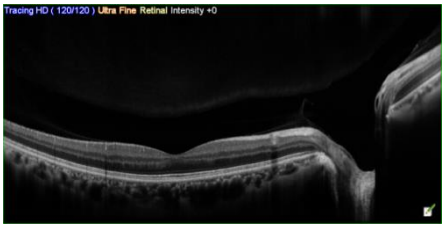
Auto Shot
- This function captures an image automatically when the scan line is aligned to the target on the fundus.

Baseline
Baseline is a criterial image in the follow-up examination.

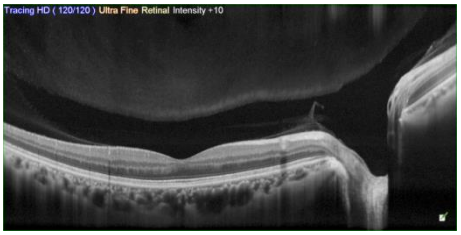
[NFL+GCL+IPL]
- Ganglion Cell Complex

Enhanced Image
- The "enhanced image" function allows the operator to adjust the intensity of an image to enhance details.

Normal Capture (Intensity: 0)



Enhanced Image (Intensity: 10)



Follow-up
- Follow-ups perform the registered baseline scans to capture with the same OCT settings as the baseline images
- Follow-up allows for observation of structural and functional change in the retina. (Multifunctional follow-up: see page 16)

HD scan
- "HD" is for high definition which is a processing that removes noise~~s~~ in the obtained OCT images by creating an averaged image from multiple images. The B-scan is executed multiple times for the HD processing. Therefore, the greater the number of the HD scan images is, the longer it takes to finish the HD processing. The number of times of the HD scan is specified with the "HD ACQUISITION NUMBER" setting.

OCT Phase Fundus image
- A fundus front on (en face) image composed using three-dimensional data of OCT fundus images.

OCT Sensitivities

- Regular
  -Allows high-speed image capture with standard OCT Sensitivity
- Fine
  -By increasing the OCT sensitivity a higher SSI value higher than "Regular" can be achieved
- Ultra Fine
  -By increasing the OCT sensitivity a higher SSI value higher than "Fine" can be achieved.
  *For more detailed information, please see the page 24 (troubleshooting No.10).

Polarization adjustment (OCT polarization adjustment)

- The polarization of the light reflected from the retina and that of the reference light are aligned to strengthen the signal for obtaining high quality OCT cross-sectional fundus images.

SSI

- SSI stands for Signal Strength Index, and is a value that evaluates the OCT image signal and back noise on the scale of 10. The higher the evaluation is, the finer the obtained OCT cross-sectional image of the fundus becomes.

Z position (Z-Pos)

- The Z position is the position of the cross-sectional image of the fundus in the OCT image.
- In Retinal mode, when the Z position is adjusted to the P (posterior) side, the OCT cross-sectional image moves up. Adjusting the Z position to the A (anterior) side moves the OCT cross-sectional image downward.

Visual Acuity Conversion Table

- The Chart below shows currently available measurements of visual acuity. You can utilize it for converting from one format to another.

Fraction (meters)	Fraction (feet)	LogMAR	Decimal
6/200			0.03
	20/600		0.032
6/150	20/500		0.04
6/120	20/400		0.05
6/100			0.06
	20/320		0.063
6/75	20/250		0.08
6/60	20/200	1	0.1
6/48		0.9	0.125
	20/150		0.15
6/38		0.8	0.16
6/30	20/100	0.7	0.2
6/24	20/80	0.6	0.25
	20/70		
6/20			0.3
	20/60		0.32
6/15	20/50	0.4	0.4
6/12	20/40	0.3	0.5
6/10			0.6
	20/30		0.63
			0.7
6/7.5	20/25	0.1	0.8
			0.9
6/6	20/20	0	1
6/5			1.2
			1.25
	20/15		
6/4			1.5
		-0.2	1.6
6/3	20/10	-0.3	2
			2.5

BIRMINGHAM
OPTICAL
THE OPTICAL COMPANY

Should you need to contact Birmingham Optical regarding any

support or service related enquiries please call:

0121 442 5886

Or

email oct@birminghamoptical.co.uk