
**User's
Manual**

**TA320/TA520
Optical Disk Jitter Analysis Software**

IM 704216-61E
1st Edition

Foreword

Thank you for purchasing the Optical Disk Jitter Analysis Software (704216) for the Time Interval Analyzer TA320/TA520.

This User's Manual contains useful information about the precautions, functions, and operating procedures of the software. This manual mainly focuses on the operating procedures using Windows 95. To ensure correct use, please read this manual thoroughly before operation.

Keep this manual in a safe place for quick reference in the event a question arises.

For information about the handling precautions, functions, and operating procedures of the Time Interval Analyzer TA320/TA520 and the handling and operating procedures of MS-DOS/Windows, see the respective manuals.

Notes

- The contents of this manual are subject to change without prior notice as a result of continuing improvements to the instrument's performance and functions. The figures given in this manual may differ from the actual screen.
- Every effort has been made in the preparation of this manual to ensure the accuracy of its contents. However, should you have any questions or find any errors, please contact your nearest YOKOGAWA dealer as listed on the back cover of this manual.

Trademarks

- Windows and MS-DOS are a registered trademark of Microsoft Corporation.
- Other company and product names are trademarks or registered trademarks of their respective holders.

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Product Overview

Software

This software application (704216) is capable of 1) determining the delta average and the standard deviation of the data measured by the Time Interval Analyzer TA320/520, 2) display the graph and the list, and 3) print the results to a printer that is connected to a PC.

Measurement data that are handled

Data measured using the hardware histogram mode on the Time Interval Analyzer TA320/TA520.

- Data above that have been saved to a binary file (.wvf extension) along with the header file (.hdr extension).
- Data that have been measured by the TA320/TA520 and loaded into this software application via the communication interface (GP-IB).
(You cannot use this software application load (or read) data from the TA320/TA520's floppy disk drive via GP-IB.)
- Binary format data that have been saved using this software application (.tad extension)

System Requirements

PC

PC capable of running Windows 95/98 or Windows NT 4.0 with at least 16 MB of RAM

Operating System

Microsoft Windows 95/98 or Windows NT 4.0.

GP-IB board

To load data via communication interface, a GP-IB board made by NI (National Instruments) must be installed in the PC.

CRT, printer, and mouse

Those supported by Microsoft Windows 95/98 or Windows NT 4.0.

Precautions on Use

Storing the system floppy disk

Please store the original system floppy disk (software) in a safe place. During the actual operation, use the software that is installed on the hard disk.

Agreement

- **Restriction on Use**

Use of this product (this utility software and manual) by more than one computer at the same time is prohibited. Use by more than one user is also prohibited.

- **Transfer and Lending**

Transfer or lending of this product to any third party is prohibited.

- **Guarantee**

Should a physical deficiency be found on the original floppy disk or this manual upon opening the product package, please promptly inform Yokogawa. The claim must be made within seven days from the date you received the product in order to receive a replacement free of charge.

- **Exemption from Liability**

Yokogawa Electric Corporation provides no guarantees other than for physical deficiencies found on the original floppy disk or this manual upon opening the product package. Yokogawa Electric Corporation shall not be held responsible by any party for any losses or damage, direct or indirect, caused by the use or any unpredictable defect of the product.

Before installation

Backing up the system floppy disk

Please make a back up disk (2HD 1.44 MB) of the software on the original system floppy disk that you have purchased. Use the backup copy for all future operations including installation. When installing the software, set the floppy disk's write protect switch to allow writing.

Back up procedures

From the MS-DOS prompt on Windows or on DOS, enter the command "diskcopy a: a:" to start the back up procedures. Follow the instructions that appear on the screen.

Installing the software

Procedure

The following procedures are for installing the software on Windows 95.

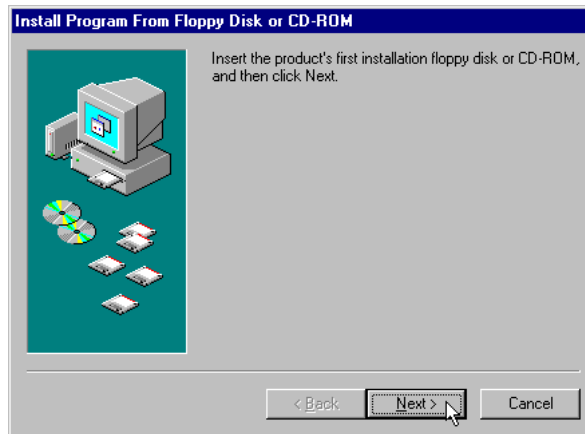
1. Start Windows.
2. Open the Control Panel folder and double-click “Add/Remove Programs.”



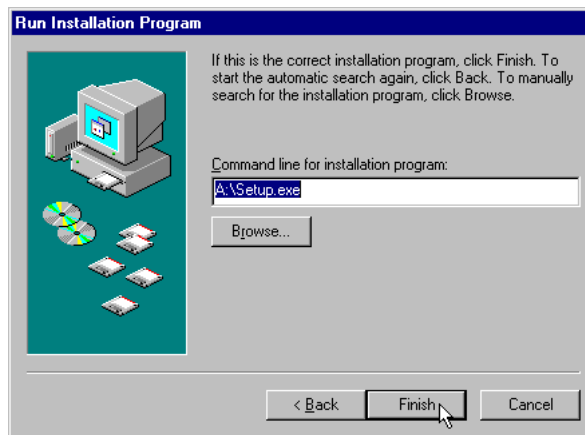
3. Click the “Install” button under the “Install/Uninstall” tab. The installation program starts.



4. Insert the system floppy disk (backup copy) into the floppy disk drive and click the "Next" button.



5. Confirm that the command line text box is set to "A:\SETUP.EXE" and click the "Finish" button.>

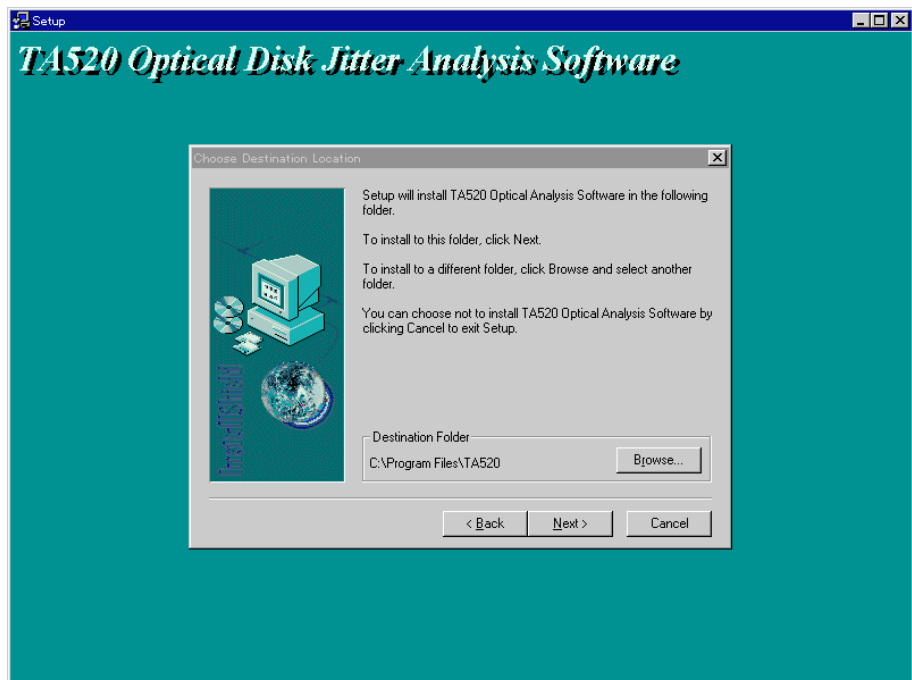


6. The following screen appears. Click the "Next" button.



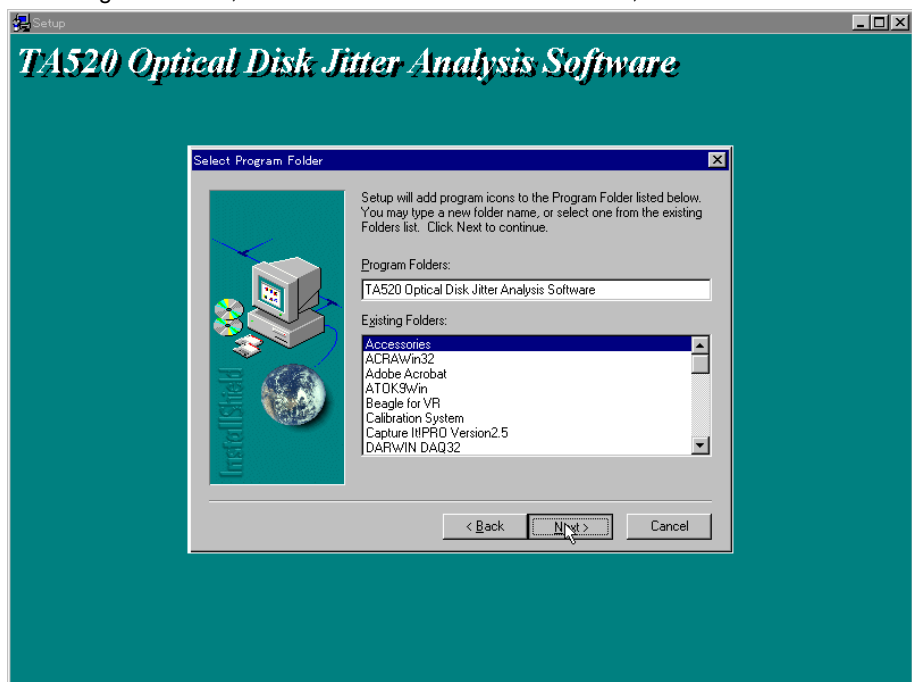
- The installation program prompts you to specify the installation destination. Change the destination as necessary.

The default setting is “C:\Program Files\TA520.” After entering the destination, click the “Next” button.

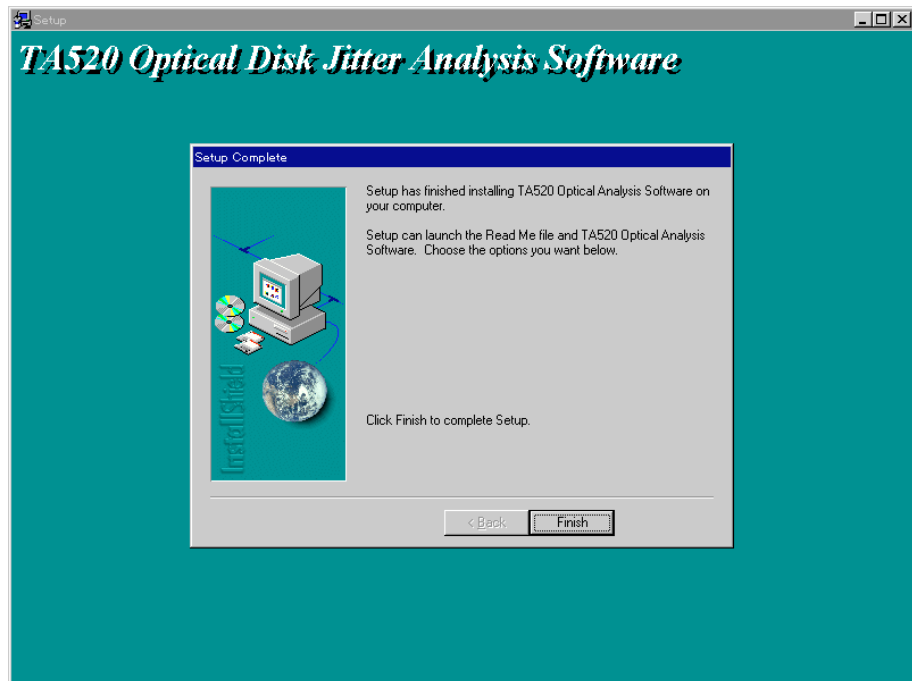


- Specify the program folder.

To change the folder, enter the desired folder name. Then, click the “Next” button.



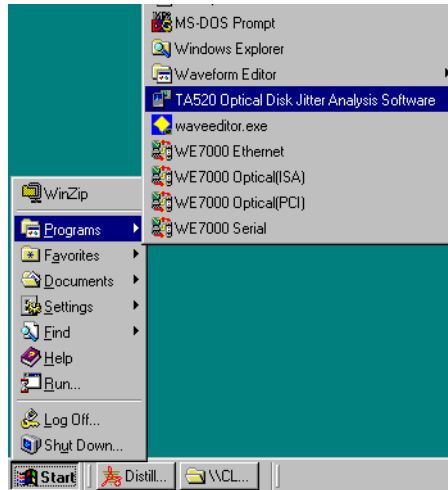
9. The following screen appears when the installation is completed. Click the "Finish" button.



Starting the software

Procedure

Start the program by selecting “TA520 Optical Disk Jitter Analysis Software” from the start menu.



Explanation

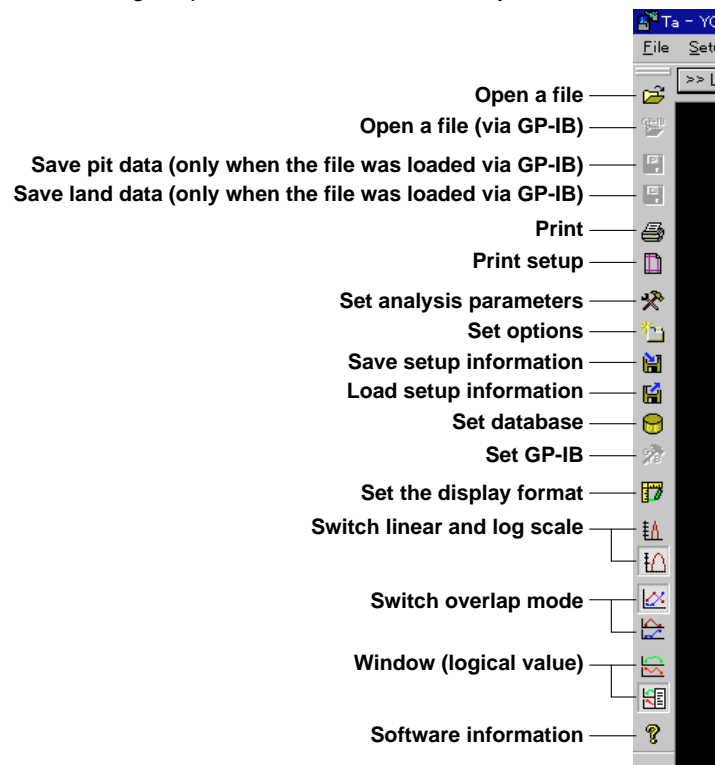
For Windows 95, the TA520 Optical Disk Jitter Analysis Software is located in the program folder within the start menu folder.

Note

“Start options” can be specified in order to start the software using the setup information that has been saved previously. This allows the software to be started with the same settings every time. When the setup file cannot be found, the software is started using the previous settings.
TA.EXE_-f:path to the setup information file (Example) TA.EXE_-f:C:\TA320\set1.cfg
To specify the start options, create a shortcut and enter the options in the properties target box.

Using the toolbar

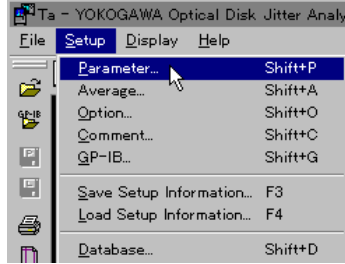
When the program is started, a toolbar is displayed on the left edge of the window. By clicking the appropriate buttons on the toolbar, various functions that are described in the following chapters can be executed directly.



1.1 Setting Parameters to be Analyzed/Easy Setting

Procedure

1. Click "Setup" to display the setup menu.
2. Click "Parameter" to display the parameter setting dialog box.



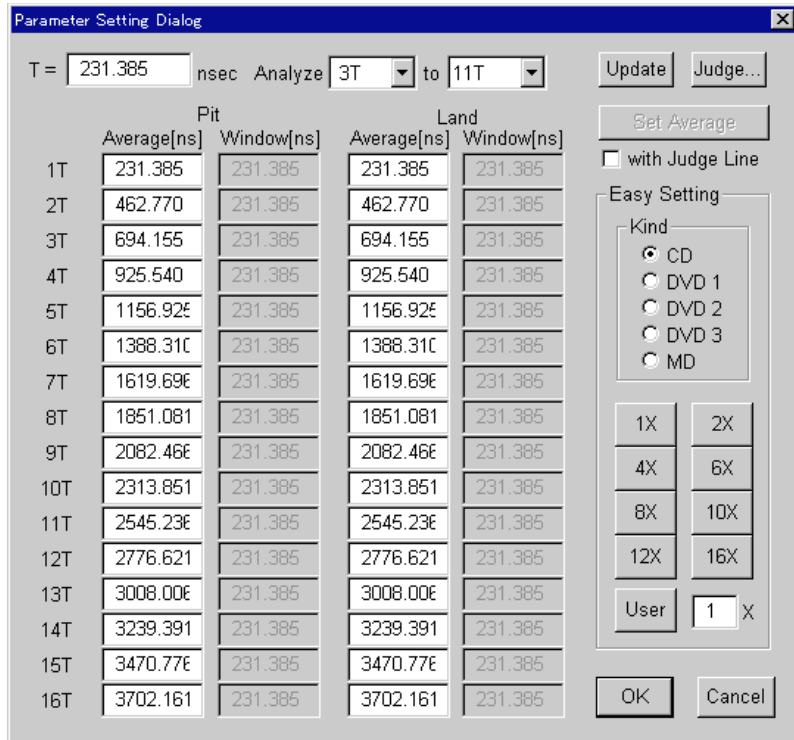
Setting the average and window values at once

3. Enter the value of constant T in the "T=" box.
4. Click the "Update" button. The window width of windows 1T to 16T are set to the same value as constant T, and the average values are set to the center values of each window. For the procedures regarding "Set Average," see section 2.1.



Setting the average values individually

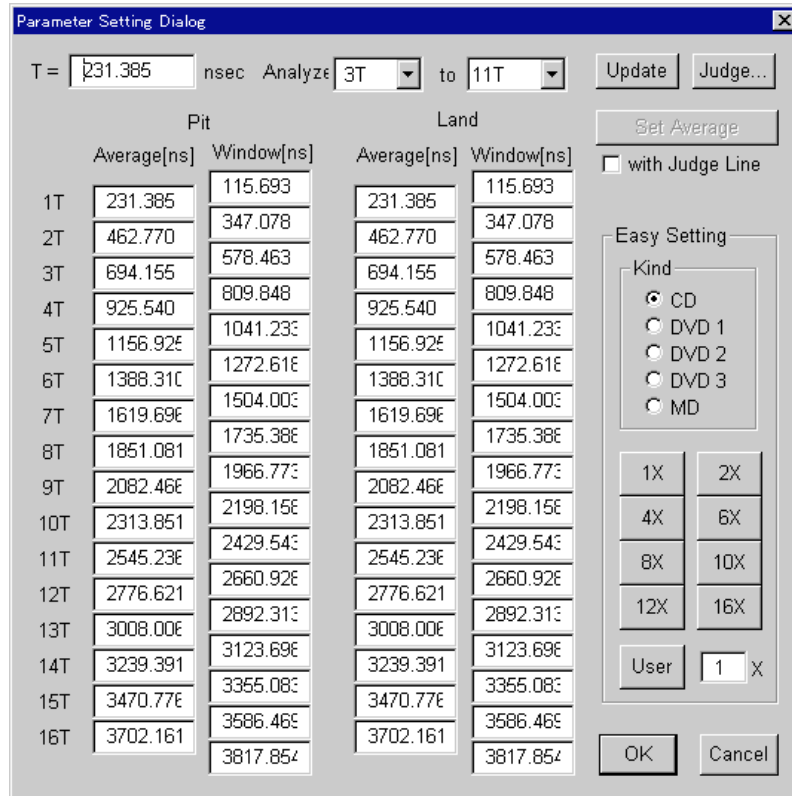
5. As necessary, enter appropriate values in the Average[ns] box located to the right of windows 1T to 16T.



Setting the window width individually

This operation is possible when the “Window Position” of “Adjust Window Parameter” described in section 1.3 is checked.

- As necessary, enter the start and end times in the appropriate boxes under Window[ns] located to the right of windows 1T to 16T.



Selecting the analysis start window T and analysis end window T

- Select the analysis start window T in the “Analyze” box.
- Select the analyze end window T in the “to” box to the right of the “Analyze” box.

Easy setting

- Click the “Kind” radio button under “Easy Setting” and select the clock period (disk type). For the clock period settings for DVD1, DVD2, DVD3, and MD under “Kind,” see section 1.4.
- To set the speed, click the “X1” to “X16” buttons under “Easy Setting” or enter the desired speed in the box to the left of the “User” box and click the “User” box. The average values and window widths of windows 1T to 16T are set to appropriate values corresponding to the clock period and speed.
- Select analysis start window T and analysis end window T according to steps 7 and 8. As necessary, enter values in the Average[ns] and Window[ns] boxes for each window according to steps 5 and 6.

Performing analysis

- When you are ready to analyze the measured data using the specified settings, click the “OK” button. To cancel, click the “Cancel” button.

Explanation

Setting the average and window values at once

You can set the average values and window widths of windows 1T to 16T based on the value of constant T.

- Average value: The value used when calculating the Delta average. Normally the average value is set to an ideal average value around which one would expect the measured data to be distributed (designed value or logical value, for example). However, in this case, the value is set to the center value of the window width. You can also specify an average value that is measured (see section 2.1).
- Window width: The time span of one window.
 - * Delta average is the offset between the ideal average value and the actual average value that has been measured.

Setting constant T

Constant T sets the window width. Generally, this value is set to the sampling clock period of the disk or drive that is being analyzed.

Range: 1 to 10000 ns. Resolution: 0.001 ns.

Setting the average values individually

The average values of windows 1T to 16T can be specified individually.

- The average value can be set to any value within each window width.
- Range: Constant T/2 to 100 ns. Resolution: 0.001 ns.

Setting the window width individually

The window width is the difference between the start time and the end time.

- Set the start time so that it is less than the end time.
- The end time of the previous window is the start time of the next window.
- Range: 1 to 10000 ns. Resolution: 0.001 ns.

Selecting the analysis start window T and analysis end window T

Select the range of windows to be analyzed.

- Selectable range for analysis start window T: 1T, 2T, and 3T
- Selectable range for analysis end window T: 1T, 2T, 3T, 4T, 5T, 6T, 7T, 8T, 9T, 10T, 11T, 12T, 13T, 14T, 15T, and 16T

Note

If the number of data points of analysis end window T is greater than or equal to 32000 points (for TA320) or 512000 points (TA520) after making the settings, a message "Invalid start T/end T" is displayed and the analysis cannot be performed.

Easy setting

If the clock period or speed is known beforehand, the value can be applied in setting the average value and the window width.

- **Selecting the clock period**

Select from the following list of choices.

CD: The clock period of a compact disk, 231.385 ns, is assigned. This value cannot be changed.

DVD1: An initial value, 38.2 ns, is assigned.

DVD2: An initial value, 38.19 ns, is assigned.

DVD3: An initial value, 33.33 ns, is assigned.

MD: An initial value, 231.385 ns, is assigned.

For the clock period settings for DVD1, DVD2, DVD3, and MD, see section 1.4.

- **Selecting the speed**

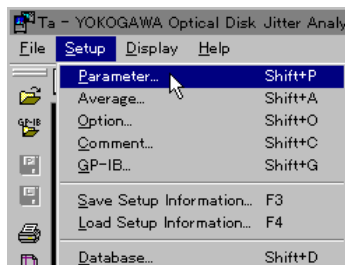
Select the speed (multiplier) from the following list of choices. The clock period is divided by the selected multiplier and the result is applied to the average value and window width.

X1, X2, X4, X6, X8, X10, X12, X16, and User settings (range: 1 to 24, resolution: 0.01)

1.2 Setting the judgement value of the analyzed data

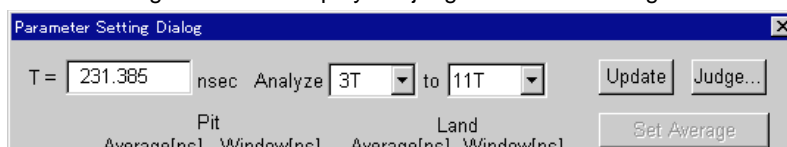
Procedure

1. Click "Setup" to display the setup menu.
2. Click "Parameter" to display the parameter setting dialog box.

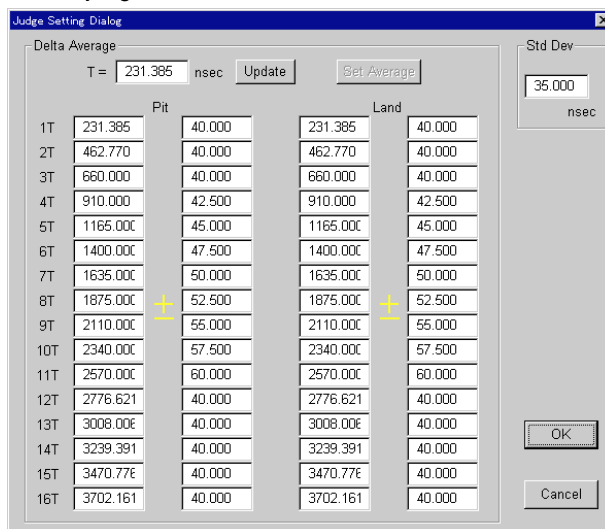


Setting the judgement value

3. Click the "Judge" button to display the judgement value dialog box.



4. Set the center value of judgement in the box to the left of the \pm sign and the allowed range in the box to the right of the sign.
5. Set the judgement value of the standard deviation in the "Std Dev" box.



Activating the judgement value

6. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button. The judgement results are displayed when the analyzed data are displayed on the graph. By using the judge line, the value is checked whether or not it exceeds the judgement value. See section 3.1.

Explanation

Setting the center value of judgement

The center values of judgement of windows 1T to 16T can be specified individually.

- The center value of judgement can be specified to a value within each window width.
- Range: Constant T/2 to 10000 ns. Resolution: 0.001 ns.

Setting the allowed range

Set the allowed range with respect to the center value of judgement.

Range: 1 to 10000 ns. Resolution: 0.001 ns.

Setting the standard deviation

Set the judgement value for the standard deviation.

Range: 1 to 1000 ns. Resolution: 0.001 ns.

Updating the judgement value

Clicking the "Update" button after entering the constant T updates the judgement value of "Pit/Land."

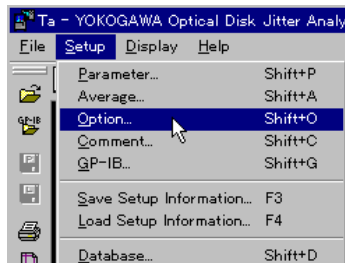
Setting the average value

Clicking the [Set Average] button sets the average value of the measured data in the "Pit/Land" judgement value.

1.3 Moving the Window Using the Mouse and Changing the Window Width

Procedure

1. Click "Setup" to display the setup menu.
2. Click "Option" to display the parameter setting dialog box.

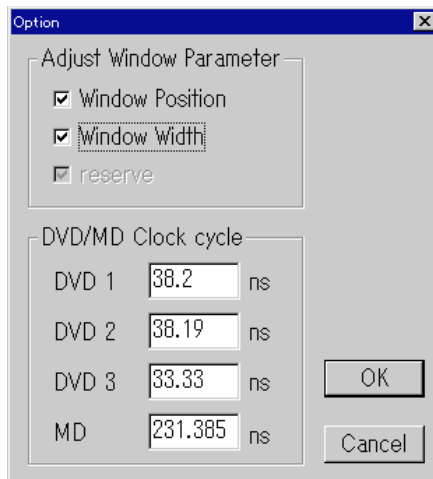


Moving the window using the mouse when displaying the graph

3. Check the "Window Position" box under "Adjust Window Parameter."

Changing the window width using the mouse when displaying the graph

4. Check the "Window Width" box under "Adjust Window Parameter."



Activating the new settings

5. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button.

Explanation

Moving the window

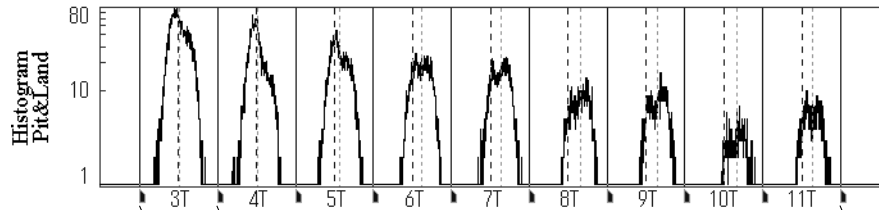
By checking the "Window Position" box, you can move the histogram display window left and right using the mouse. The parameters that are analyzed, the average value, the start time, and the end time (see section 1.1), reflect the result of this movement.

Movement range: From the left end of the histogram to the end time of the analysis end window T (however, up to 3200.0 ns for TA320 and up to 128.0 ns for TA520).

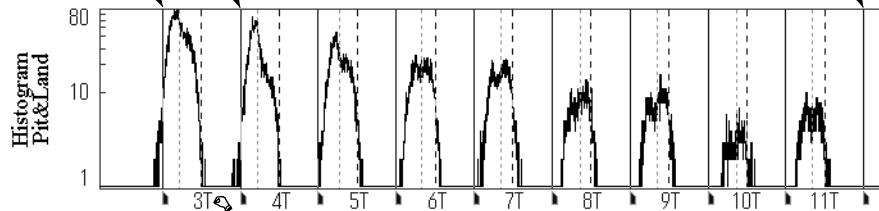
Movement resolution: 0.001 ns (TA320), 0.00025 ns (TA520)

Date&Time Pit:(95/09/27 11:24:00)

• Before movement



• After movement



A "hand" mark appears when the left mouse button is pressed. By dragging the hand left and right, you can move the entire window left and right.

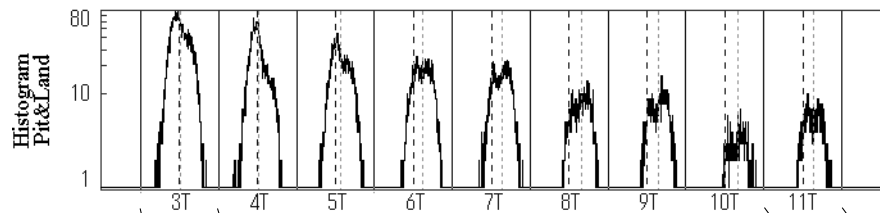
Changing the window width

By checking the "Window Width" box, you can change the window width of the histogram display using the mouse. The result of this change affects not only the window width of the parameter analyzed, but also the average value (see section 1.1).

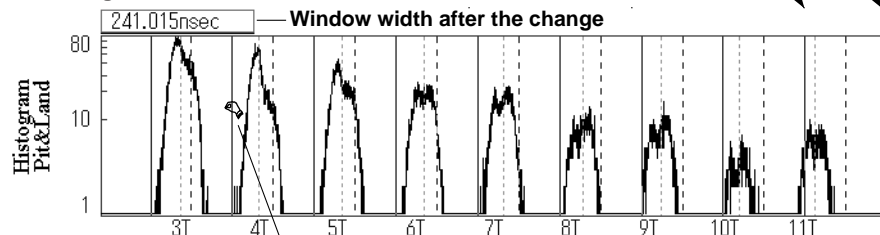
Range of change: 1 to 10000 ns (however, within the allowed range for parameter constant T, see "Note" on page 1-3) Change resolution: 0.001 ns

Date&Time Pit:(95/09/27 11:24:00)

• Before the change



• After the change



A "hand" mark appears when the left mouse button is pressed. By dragging the hand left and right, you can change the width of the entire window.

Changing the window width of each window

When only the “Window Position” under “Adjust Window Parameter” is checked, the window width of the histogram display can be changed for each window using the mouse.

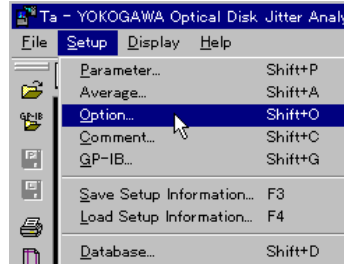
Note

How the window width affects the various values varies depending on whether or not the Pit/Land histogram is being displayed overlapped. When the histogram is being displayed overlapped, the window width and center value of both the Pit and Land are changed. When the histogram is not being displayed overlapped, the values of either the Pit or Land are changed.

1.4 Setting the Clock Period for the Analysis Parameter Easy Setting

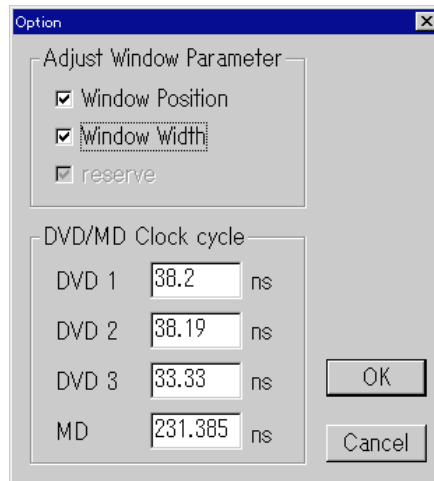
Procedure

1. Click "Setup" to display the setup menu.
2. Click "Option" to display the parameter setting dialog box.



Setting the clock period

3. Set values in the DVD1, DVD2, DVD3, and MD boxes under "DVD Clock cycle."



Activating the new settings

4. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button.

Explanation

Setting the clock period

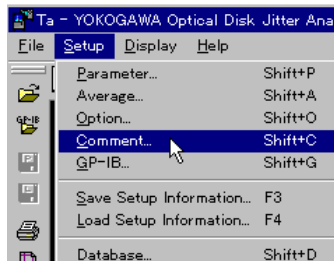
Set the clock period that is used during easy setting of analysis parameters (see section 1.1). You can set values for DVD1, DVD2, DVD3, and MD.

Range: 1 to 300 ns. Resolution: 0.001 ns.

1.5 Entering Comments

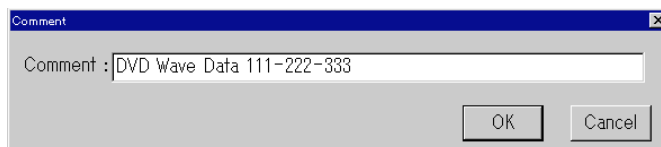
Procedure

1. Click "Setup" to display the setup menu.
2. Click "Comment" to display the comment entry dialog box.



Entering comments

3. Enter comments in the "Comment" box.



Activating the new settings

4. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button.

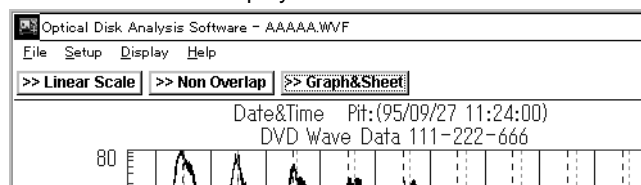
Explanation

Number of characters that can be entered

There is no limit in the number of characters that can be entered, but not all the characters may be displayed or printed.

Displaying comments

The comments are displayed as shown below.



Deleting comments

Delete all the characters in the comment entry dialog box and click the "OK" button.

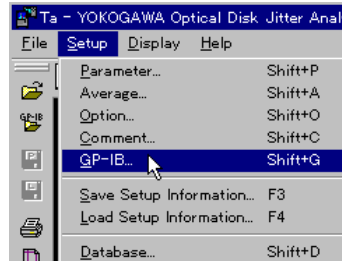
1.6 Setting the GP-IB Address and Testing GP-IB Communications

Procedure

The procedures are not possible if the GP-IB board is not installed.

1. Click "Setup" to display the setup menu.
2. Click "GP-IB" to display the GP-IB dialog box.

(The button cannot be selected if the GP-IB board is not installed.)



Entering the GP-IB address

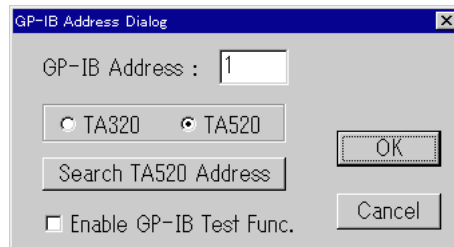
3. Enter the GP-IB address of the Time Interval Analyzer TA320/TA520 in the "GP-IB Address" box.

Searching the address

4. Click either the TA320 or the TA520 radio button to select the item to be searched.
5. When the "Search TA320 Address" or the "Search TA520 Address" is clicked, the address of the TA320 or the TA520 that is connected via GP-IB interface is searched and the address is set in the "GP-IB Address" box.

Setting the GP-IB communication test mode

6. Check the "Enable GP-IB Test Func." box. The communication test is executed from the file menu. See section 2,2.



Activating the new settings

7. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button.

Explanation

Entering the GP-IB address

- Enter the address of the TA320 or the TA520 that is connected via GP-IB interface.
- For the range of addresses for the TA320/TA520, see section 1.4 in the GP-IB Interface User's Manual IM704210-12 or IM704310-12.
- If the specified address does not match the actual address, data cannot be loaded.

Searching the address

- Searches the address of the TA320 or the TA520 that is connected via GP-IB interface.
- The address does not change if the TA320/TA520 is not connected.
- If there are multiple TA320/TA520s that are connected, the smallest address is set in the "GP-IB Address" box.

GP-IB communication test mode

The communication test is executed from the file menu. See section 2,2. However, if the "Enable GP-IB Test Func." box is not checked, the menu does not appear.

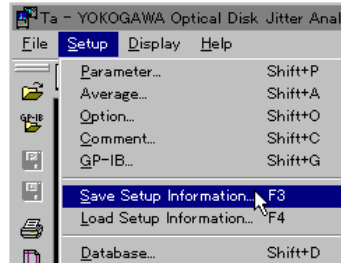
1.7 Saving and Loading Setup Information

Procedure

1. Click "Setup" to display the setup menu.

Saving the setup information

2. Click "Save Setup Information" to display the setup information save dialog box.

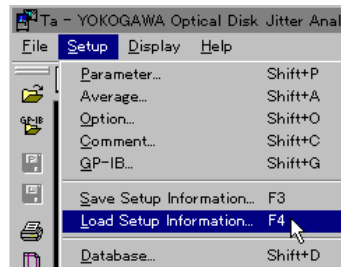


3. Enter the name of the file to be saved in the "File name" box. Set the file extension to .cfg. As necessary, set or select the "Save as type" and "Save in" information.



Loading the setup information

4. After step 1, click "Load Setup Information" to display the setup information load dialog box.



- Enter the name of the file to be loaded in the "File name" box. The file extension is .cfg. As necessary, set or select the "Files of type" and "Look in" information.



Saving or loading

- After step 3 or 5, click the "Open" or "Save" button to save or load the setup information. To cancel, click the "Cancel" button.

Explanation

Information that is saved or loaded

- Parameters to be analyzed: See section 1.1.
- Judgement value of analysis data: See section 1.2.
- ON/OFF state of the window movement and window width change using the mouse: See section 1.3.
- Clock period used during easy setting of analysis parameters: See section 1.4.
- Comments: See section 1.5.
- Display format: See section 3.1.
- Display color: See section 3.2.

The name and extension of the file to be saved or loaded

- The file name can be specified in the range that is defined by the operating system.
- Use ".cfg" for the file extension.

Notes when saving or loading

- When saving the setup information, no warning messages will be displayed even if the file with the same name already exists. The file will be overwritten when the "Save" button is clicked.
- When the setup information is loaded ("Open" is clicked), the settings that existed before are cleared.

1.8 Saving and Loading the Average Values

Procedure

1. Click "Setup" to display the setup menu.

Saving the average values

2. Click "Average" to display the average information dialog box. When the graph and sheet are displayed simultaneously, you can also double-click the Delta average sheet to open this dialog box.
3. Enter the values of T that need to be changed, enter comments (information about the average value, for example), and click the "Save Avg" button to display the save dialog box.
4. Enter the name of the file to be saved in the "File name" box. Set the file extension to .avg. As necessary, set or select the "Save as type" and "Save in" information.
5. Clicking the "Save" button saves the average values. If you do not wish to save the values, click the "Cancel" button.

Average Information Dialog

Comment :

Analyze 3T to 11T (red bar zone)

Pit Average[ns]		Land Average[ns]	
Meas or Load	Parameter	Meas or Load	Parameter
1T	231.385	1T	231.385
2T	462.770	2T	462.770
3T	570.850	3T	694.155
4T	790.650	4T	925.540
5T	1041.250	5T	1156.925
6T	1272.600	6T	1388.310
7T	1503.950	7T	1619.696
8T	1735.300	8T	1851.081
9T	1966.650	9T	2082.466
10T	2198.000	10T	2313.851
11T	2429.700	11T	2545.236
12T	2776.621	12T	2776.621
13T	3008.006	13T	3008.006
14T	3239.391	14T	3239.391
15T	3470.776	15T	3470.776
16T	3702.161	16T	3702.161

Get Meas Avg Load Avg... Save Avg... Set to Param Cancel OK

Average values derived from measurement or average values loaded from a file

Average values that were specified in the parameter setting dialog box

- * The "Meas or Load (left column)" of Pit/Land displays the average values derived from measurement or the average values loaded from a file. The "Parameter (right column)" displays the average values that were specified in the parameter setting dialog box ("Average (ns) in the Parameter setting dialog box).

If this dialog box is displayed when the waveform is not being displayed, the left column of Pit or Land will display the average values of the analysis parameters. When the waveform is being displayed, the average values derived from measurement are displayed using bold characters and red bars (within the range specified in "Analyze" under "Setup -> Parameter.")

Loading the average values

3. After step 2, click the "Load Avg" button to display the load dialog box.
4. Enter the name of the file to be loaded in the "File name" box. Set the file extension to .avg. As necessary, set or select the "Files of type" and "Look in" information.
5. Clicking the "Open" button loads the average values in the "Meas or Load" column. If you do not wish to load the values, click the "Cancel" button.

After loading the values, if you need the average values derived from current measurements, click the "Get Meas Avg" button. The appropriate values will be displayed in the "Meas or Load" column.

Copying the values in the "Meas or Load" column to the "Parameter" column

4. If you wish to reflect the average values obtained from the various procedures described above to the average values of the analysis parameter, click the "Set to Param" button. The values in the "Meas or Load" column are copied to the "Parameter" column. To activate the values in the dialog box, click the "OK" button. To cancel, click the "Cancel" button.

Explanation

Of the setup information, only the average values can be saved or loaded.

The name and extension of the file to be saved or loaded

- The file name can be specified in the range that is defined by the operating system.
- Use ".avg" for the file extension.

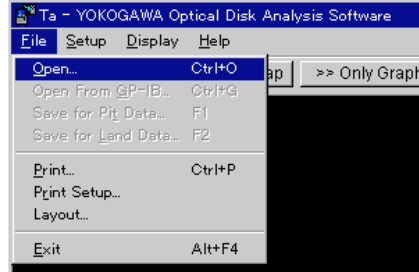
Notes when saving or loading

- When saving the average values, no warning messages will be displayed even if the file with the same name already exists. The file will be overwritten when the "Save" button is clicked.
- When the average values are loaded ("Open" button is clicked), the average values that existed before are cleared.

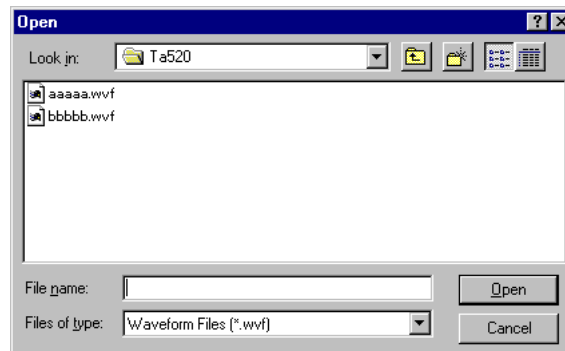
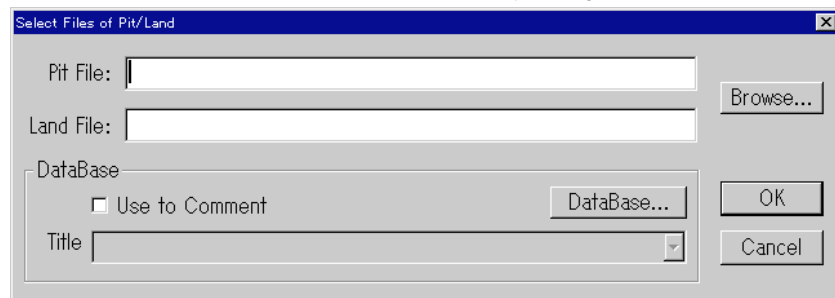
2.1 Loading Data and Setting the Average Value to the Measured Average

Procedure

1. Click "File" to display the File menu.
2. Click "Open" to display the file name entry dialog box.



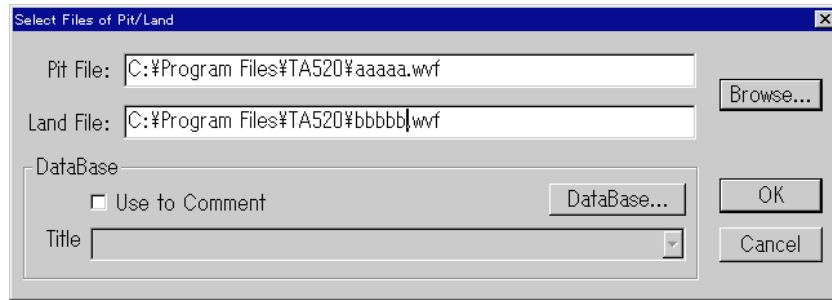
3. Enter the name of the file you wish to open in the "Pit File" or "Land File" box. Clicking the "Browse" button displays a file selection dialog box. Select the name of the file you wish to open. As necessary, set or select the "Files of type" and "Look in" information.
4. When the desired file is selected, click the "OK" button. To cancel, click the "Cancel" button. The screen returns to the file name entry dialog box.



2.1 Loading Data and Setting the Average Value to the Measured Average

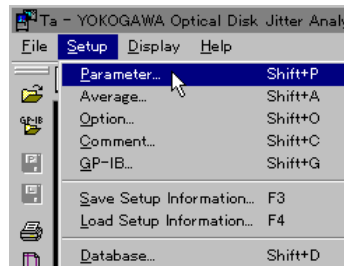
Opening the selected file

- After confirming the file name in the "Pit File" or "Land File" box, click the "OK" button to open the file. To cancel, click the "Cancel" button.

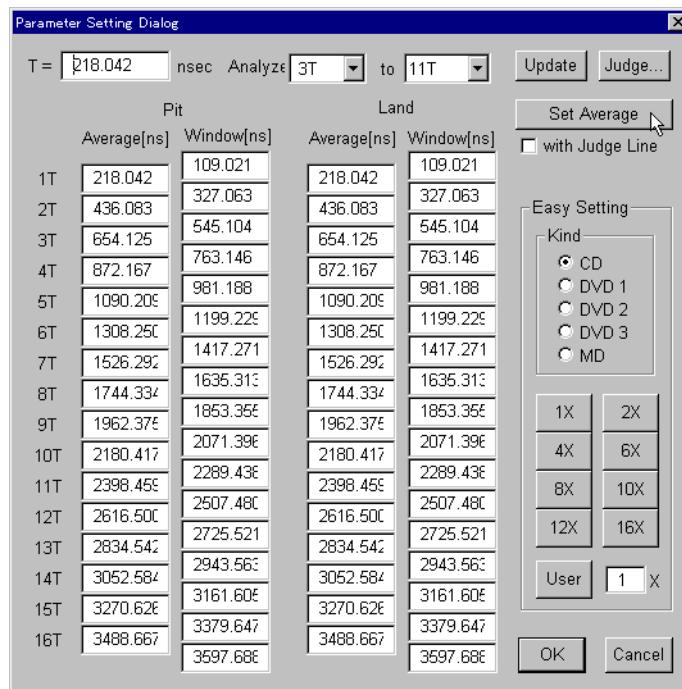


Setting the average value to the average derived from the data in the opened file

- After clicking the "OK" button in step 5, click the "Setup" to display the setup menu.
- Click "Parameter" to display the parameter setting dialog box.



- Click "Set Average" button to set the average value to the average derived from the data.



Explanation

Files that can be opened

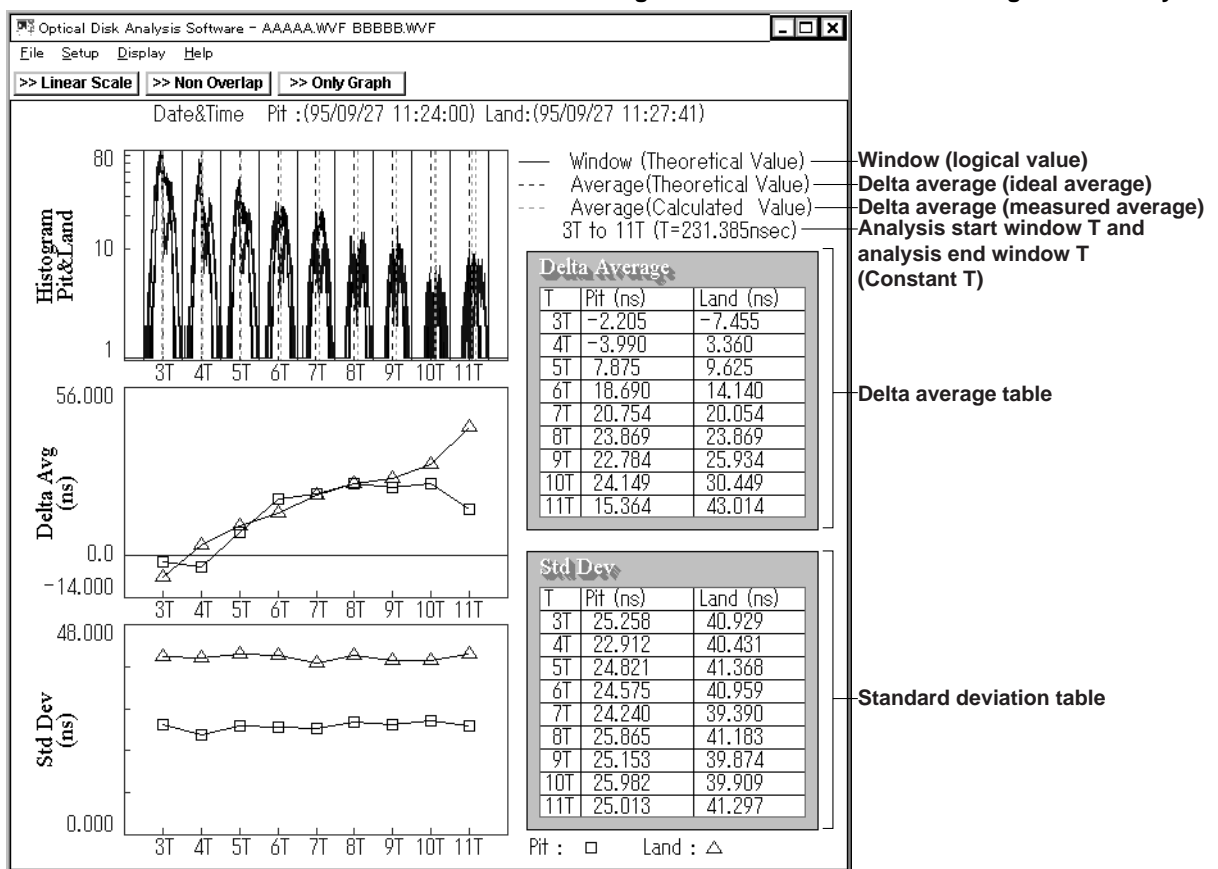
The data measured by YOKOGAWA's Time Interval Analyzer TA320/TA520 (waveform file: .wvf extension) and the data that are saved using this software application (saved file: .tad extension, see section 2.3) can be opened.

- Pit file: This file indicates the Pit signal data file (signal that is recorded or was recorded to CD/DVDs) in this software application.
- Land file: This file indicates the Land signal data file (section that complements the Pit: section of the signal that is the base for CD/DVDs) in this software application.
- The files from TA320 and TA520 cannot be opened simultaneously.

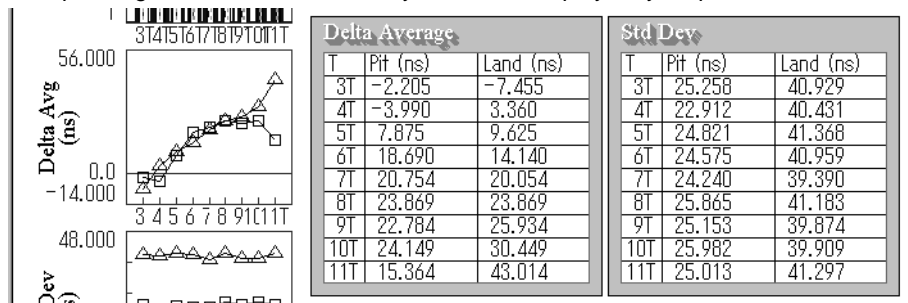
Display example

For various display methods (display format: display only the graph, set the vertical scale, etc.), see section 3.1.

- When the tables of Delta average and standard deviation are aligned vertically



- When the tables of Delta average and standard deviation are aligned horizontally
- When the tables of Delta average and standard deviation cannot be aligned vertically, the tables are automatically aligned horizontally.
- Depending on the window size, only horizontal display may be possible.



2.1 Loading Data and Setting the Average Value to the Measured Average


Setting the average values to the measured average values

The average values of the analysis parameters are set to the average values that are calculated from the data in the opened file. For analysis parameters, see section 1.1. If you check the “with Judge Line” box that is located in the analysis parameter setting dialog box, the measured average values are also reflected to the judgement table.

Notes when loading data from a PC

The analysis parameters, judgement value of analysis data, the ON/OFF state of the window movement and window width change using the mouse, the clock period used during easy setting of analysis parameters, comments, display format, and display colors are set to the settings that existed before the data are loaded.

Note

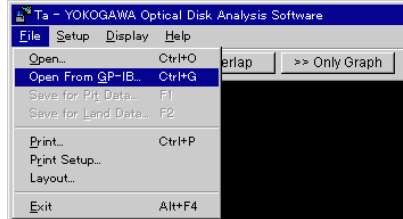
Data that have been measured with the polarity set to  or 22T (TA320 only) when making pulse width measurements on the TA320/TA520 cannot be analyzed correctly.

2.2 Loading Measured Data from the TA320/TA520 via GP-IB Interface

Procedure

The procedures are not possible if the GP-IB board is not installed.

1. Click "File" to display the File menu.
2. Click "Open From GP-IB" to display the GP-IB data load dialog box.

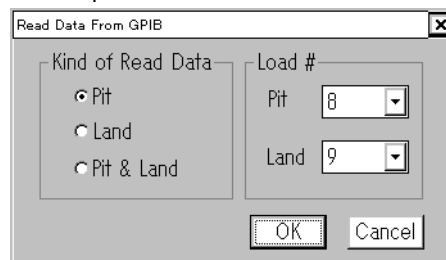


Selecting the measured data to be loaded

3. Click the "Kind of Read Data" radio button to select the measured data to be loaded.

Selecting the setup information to be loaded

4. Select the Pit and Land setup information under "Load #." The setup information is the setup information that is stored in the TA320/TA520.

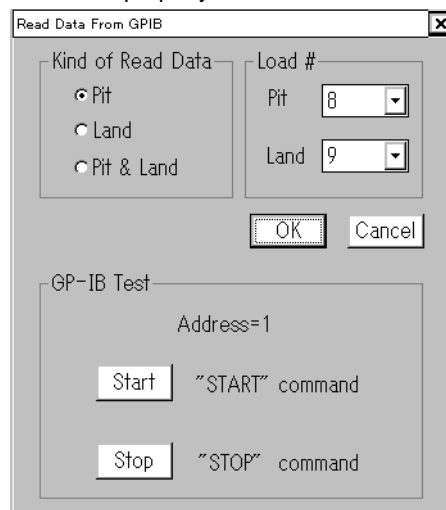


Testing communications

If the GP-IB communication test mode was specified in section 1.6 and "Open From GP-IB" is clicked in step 2, the following menu is displayed.

5. Click the "Start" button under "GP-IB Test." Check that the TA320/TA520 starts the measurement.
6. Click the "Stop" button under "GP-IB Test." Check that the TA320/TA520 stops the measurement.

If the TA320/TA520 operates properly in steps 5 and 6, the GP-IB interface is connected properly.



Loading the measured data

7. After step 4 or 6, click the "OK" button to start the measurement and to load the measured data. To cancel, click the "Cancel" button.

Explanation

Selecting the measured data to be loaded

The TA320/TA520 stops after making one measurement. The data from this measurement are loaded into this utility software. Select from the following list of choices.

- Pit: The measured data of the Pit signal (signal that is recorded or was recorded to CD/DVDs) are loaded.
- Land: The measured data of the Land signal (section that complements the Pit: section of the signal that is the base for CD/DVDs) are loaded.
- Pit & Land: The measured data of both the Pit signal and the Land signal are loaded.

Selecting the setup information to be loaded

Select the setup information that are stored in the internal memory of the TA320/TA520. You can select different setup information for Pit and Land.

Range: 0 to 9 or None

If None is selected, the settings are not changed. The settings that existed before the load are activated.

Communication test


This operation is possible if the GP-IB communication test mode was specified in section 1.6.

This test is executed in order to check whether or not communications are operating properly.

Display example

See "Display example" in section 2.1.

Note

Data that have been measured with the polarity set to  or 22T (TA320 only) when making pulse width measurements on the TA320/TA520 cannot be analyzed correctly.

2.3 Saving the Data in Binary Format

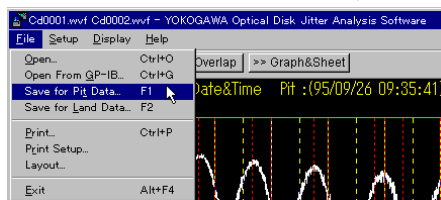
Procedure

The procedures are not possible if the GP-IB board is not installed.

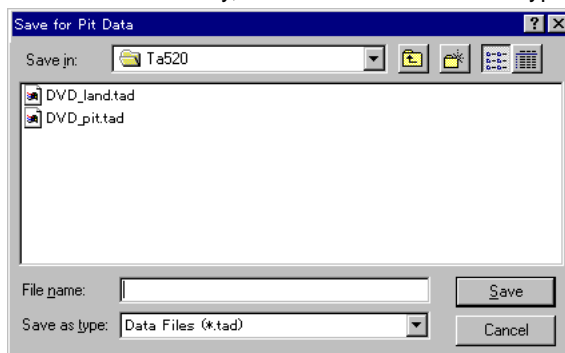
1. Click "File" to display the File menu.

Saving the Pit signal data

2. Click "Save for Pit Data" to display the Pit signal data save dialog box.

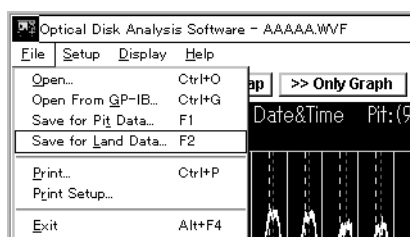


3. Enter the name of the file to be saved in the "File name" box. Set the file extension to .tad. As necessary, set or select the "Save as type" and "Save in" information.

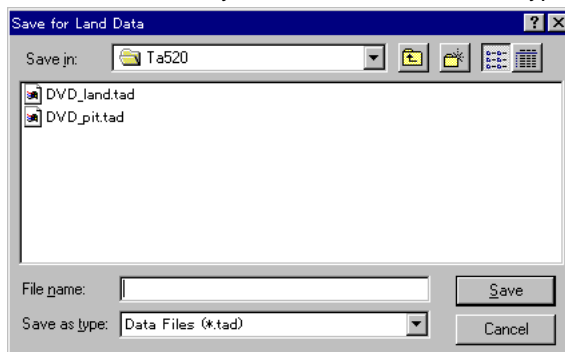


Saving the Land signal data

4. After step 1, click "Save for Land Data" to display the Land signal data save dialog box.



5. Enter the name of the file to be saved in the "File name" box. Set the file extension to .tad. As necessary, set or select the "Save as type" and "Save in" information.



Saving the data

6. To save the data with the specified settings, click the "Save" button. To cancel, click the "Cancel" button.

Explanation

The format and type of data that are saved

- The data are saved in a proprietary binary format for the software application.
- The data saved using “Save for Pit Data” are the data that are displayed on the graph as Pit signals.
- The data saved using “Save for Land Data” are the data that are displayed on the graph as Land signals.

The name and extension of the file to be saved

- The file name can be specified in the range that is defined by the PC's operating system.
- Use “.tad” for the file extension.

Notes when saving the data

When saving the data, no warning messages will be displayed even if the file with the same name already exists. The file will be overwritten when the “OK” button is clicked.

Notes when loading the data that were saved

- The analysis parameters, judgement value of analysis data, the ON/OFF state of the window movement and window width change using the mouse, the clock period used during easy setting of analysis parameters, comments, display format, and display colors are set to the settings that existed before the data are loaded.
- This file cannot be loaded by the TA320/TA520.

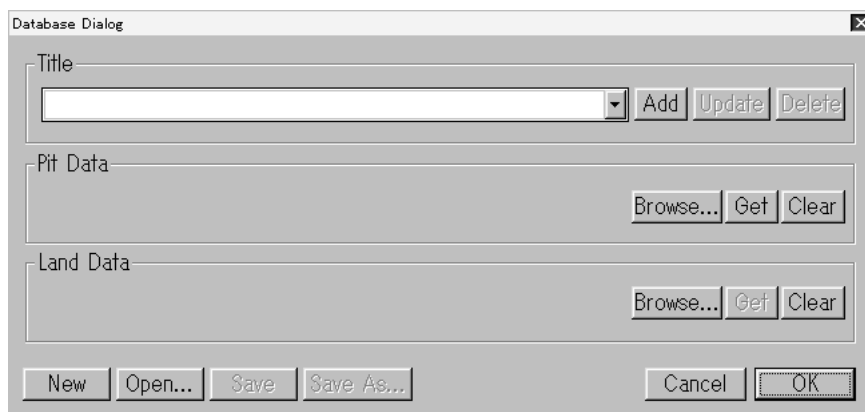
2.4 Using the Database

Procedure

1. Click "Setup - Database" to display the database dialog box.

Registering or modifying the database

2. Enter the title of the database in the "Title" box.
3. Click "Browse" or "Get" to select a "Pit Data" or "Land Data" file.
Clicking the "Clear" button clears the Pit and Land file names.
4. When the file names of the Pit and Land are specified and their titles are entered, click the "Add" button.



5. In order to change the title or file name that has been registered, select the corresponding "Title" and set the title or file name in the same fashion as in steps 1 to 3. Clicking the "Update" button completes the modification.

Note

- By checking the "Use to Comment" box in the dialog box that appears by selecting "File - Open," the title can also be used as a comment.
- Beware that duplicate titles can be registered.

Saving the registered database

2. Click "Save As" or "Save" and specify the file name for the database.

Loading the database

2. Click "Open," specify a file name, and click the "OK" button.

Creating a new database

2. Click the "New" button. The database that was being registered or modified is cleared.

Follow the steps that were described in "Registering or modifying the database" to register the new database.

Clicking "New" will clear the database that is currently loaded. If necessary, save the database before clearing it.

Note

If the database dialog box is opened by selecting "Setup - Database," the database is registered, and the "OK" button is clicked, the title list box can be used the next time the database dialog box is opened by selecting "File - Open." In addition, the title can be used as a comment by checking the "Use to Comment" box. It can be used for displaying and printing.

Explanation

This function is used to manage the Pit and Land data and their assigned titles. By using the title as a keyword to select the database, the corresponding Pit and Land data can be loaded.

Registering the database

The following two methods can be used to register a file in the database.

- Clicking the “Browse” button and selecting the file (same as opening a file).
- Clicking “Get” to specify the data that are currently displayed on the screen.

If the data are loaded via communications, the “Get” button cannot be used. However, once the data are saved, it can be used.

Saving the registered database

The registered or modified database must be saved. Otherwise, it will be lost when the application is terminated or the “New” button is clicked. Make sure to save the database that has been registered or modified.

The following two methods can be used to save the database.

- “Save As”: Save the database by specifying the destination and file name.
- “Save”: Save by overwriting

Under initial conditions, only “Save As” can be used. Once the database is saved, “Save” can be used.

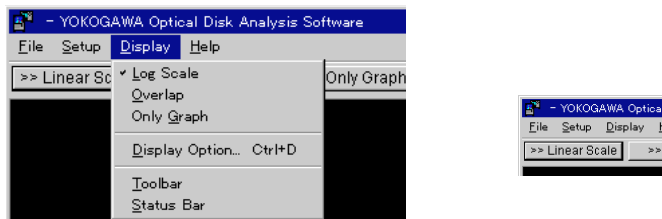
3.1 Setting the Display Format

Procedure

1. Click "Display" to display the Display menu.

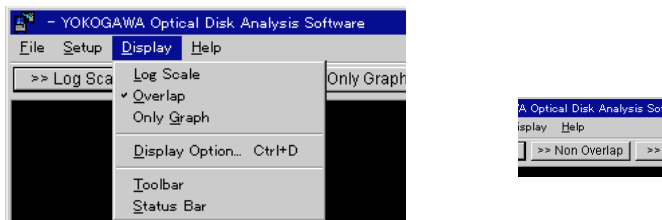
Selecting the vertical scale

2. Click "Log Scale." If there is a check mark before Log Scale, log scale is activated. If there is no check mark, linear scale is activated. You can also click the button that is located under the main menu (File, Setup, Display, and Help).



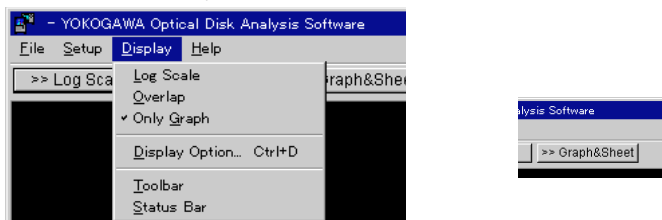
Selecting whether or not to overlap the Pit/Land signal graphs

3. After step 1, click "Overlap." If there is a check mark before Overlap, the graphs are overlapped. Otherwise, the graphs are not overlapped. You can also click the button that is located under the main menu (File, Setup, Display, and Help).



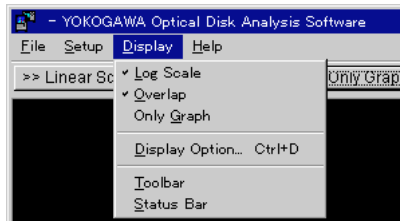
Select whether to display the graph and table simultaneously or only the graph

4. After step 1, click "Only Graph." If there is a check mark before Only Graph, only the graph is displayed. Otherwise, the graph and table are both displayed simultaneously. You can also click the button that is located under the main menu (File, Setup, Display, and Help).



Setting the upper and lower limits of the vertical axis

5. After step 1, click “Display Option” to display the display option dialog box.



• **Selecting the vertical scale mode**

6. Click the “Scale Mode” radio button under “Vertical Scale” to select the vertical scale mode. If you select “Auto,” you cannot perform steps 7 to 9. If you select “Manual,” go to step 7.

• **Entering the value using the keyboard**

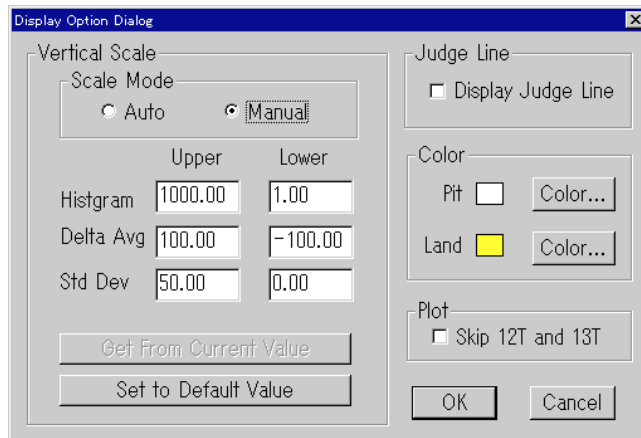
7. Set the values in the Upper and Lower boxes that are located to the right of Histogram, Delta Avg, and Std Dev under “Vertical Scale.”

• **Setting the values that are being used on the graph currently displayed**

8. After step 6, click the “Get From Current Value” button under “Vertical Scale.”

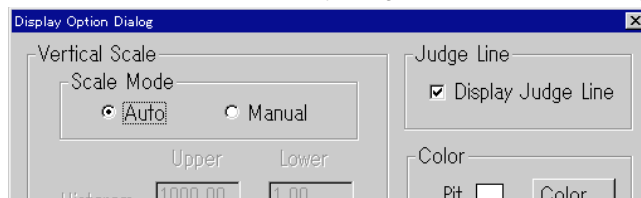
• **Setting default values**

9. After step 6, click the “Set to Default Value” button under “Vertical Scale.”



Displaying the judge line

10. After step 5, check the “Display Judge Line” box under “Judge Line.”



Activating the new settings

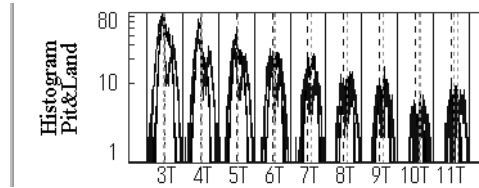
11. To activate the settings, click the “OK” button. To cancel, click the “Cancel” button.

Explanation

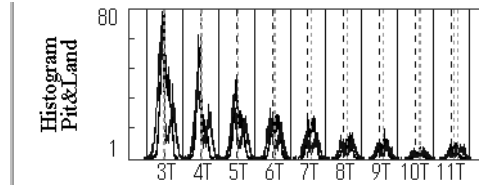
Selecting the vertical scale

You can select whether to use log scale or linear scale for the histogram's vertical axis.

- Display example when using log scale



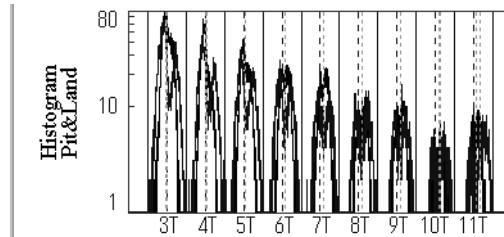
- Display example when using linear scale



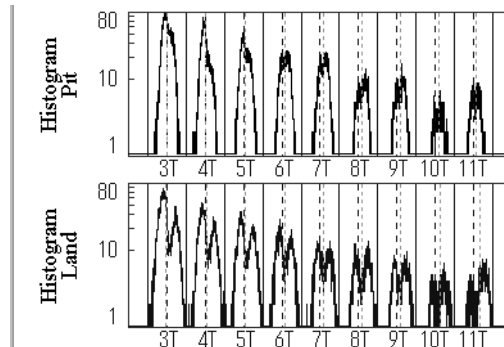
Selecting whether or not to overlap the Pit/Land signal graphs

You can select whether or not to overlap the Pit/Land signal graphs.

- Display example when the graphs are overlapped



- Display example when the graphs are not overlapped



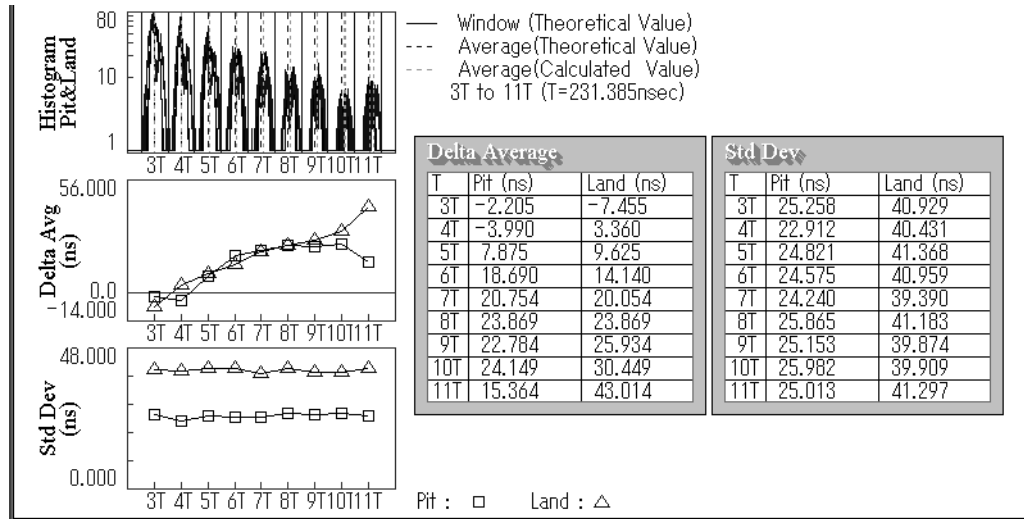
3.1 Setting the Display Format

Select whether to display the graph and table simultaneously or only the graph

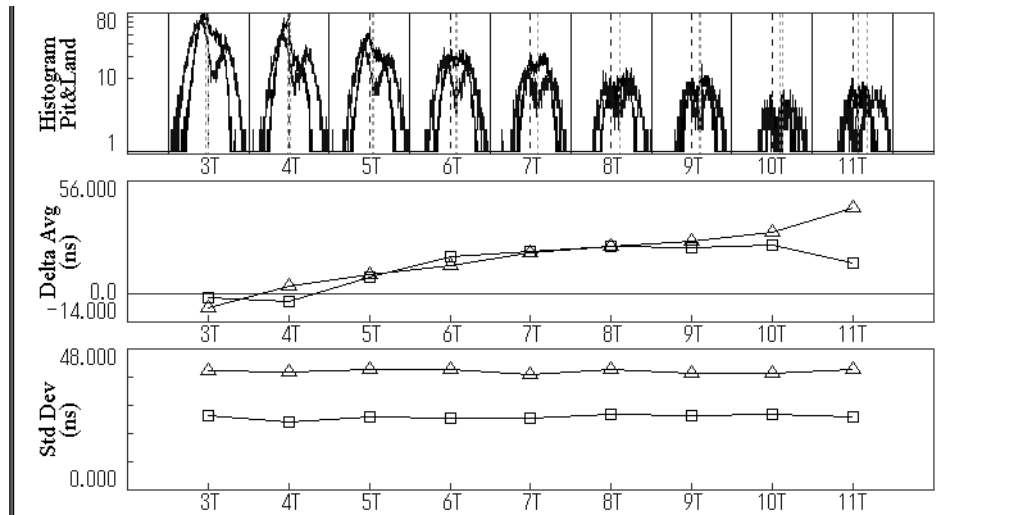
You can select whether or not to display the list of analyzed Delta average and standard deviation data along with the graph.

• **Display example of the graph and table**

See “Display example” in section 2.1, also.



• **Display example of only the graph**



Note

The measured data of Pit and Land are displayed by P-P compressing (determining the maximum and minimum values at predetermined intervals) the 32 K of data points (for TA320) or the 512 K of data points (for TA520) to approximately 10 K of data points. Statistical processing is performed on the compressed data. Therefore, the Delta average and standard deviation values will display different values than those displayed by the TA320/TA520.

On the TA320/TA520, the resolution changes when constant T is changed. However, on this software application, the resolution remains constant even if constant T (window width) is changed.

Setting the upper and lower limits of the vertical axis

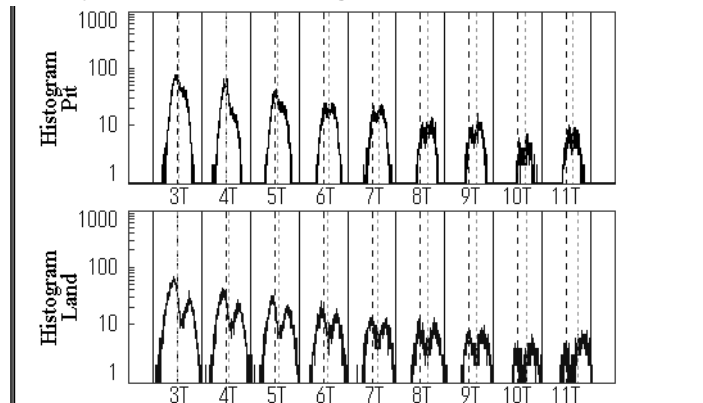
You can set the upper and lower limits of the vertical axis for the histogram, Delta average, and standard deviation.

- Auto: The upper and lower limits are automatically set so that all the loaded measurement data can be viewed.
- Manual: The upper and lower limits of the vertical axis can be set by entering values using the keyboard, applying the values of the graph currently displayed, or setting the default values.
- Range and resolution when entering values using the keyboard

Item	Range	Resolution
Histogram (Histogram)	0 to 50000	0.01
Delta average (Delta Avg)	± 5000	0.01
Standard deviation (Std Dev)	± 5000	0.01

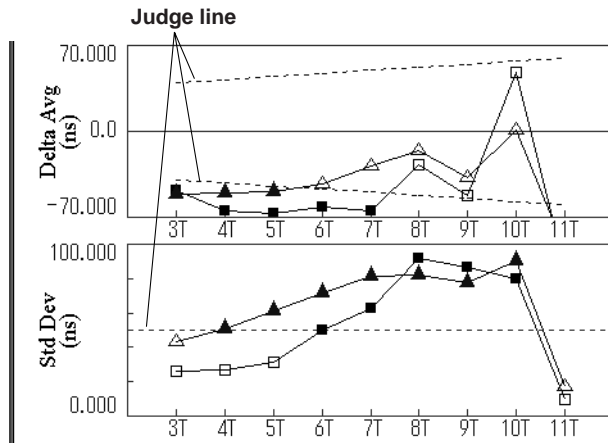
- Values of the graph currently displayed: The upper and lower limits of the vertical axis of the graph currently displayed are used.
- Default value: The following values are used.

Item	Upper Limit	Lower Limit
Histogram (Histogram)	1000.00	1.00
Delta average (Delta Avg)	100.00	-100.00
Standard deviation (Std Dev)	50.00	0.00

Display example of the histogram when the default values are used

Displaying the judge line

The judge line is displayed on the Delta average and standard deviation graphs according to the judge value specified in section 1.2.



The plot marks on the graph are filled when values are outside the region defined by the judge line for Delta average and when values are greater than or equal to the judge line for standard deviation.

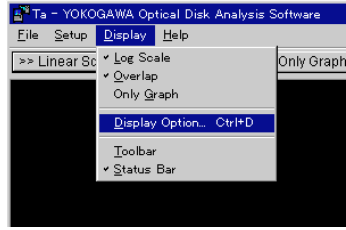
Note

- On the Delta average graph, the scale width above and below the zero line are compared. The vertical scale is assigned using the value that is obtained by dividing the side with the larger scale width into five sections.
 - If the upper and lower limits are not set properly (the lower limit is greater than the upper limit, for example), a message "Invalid scaling" appears.
-

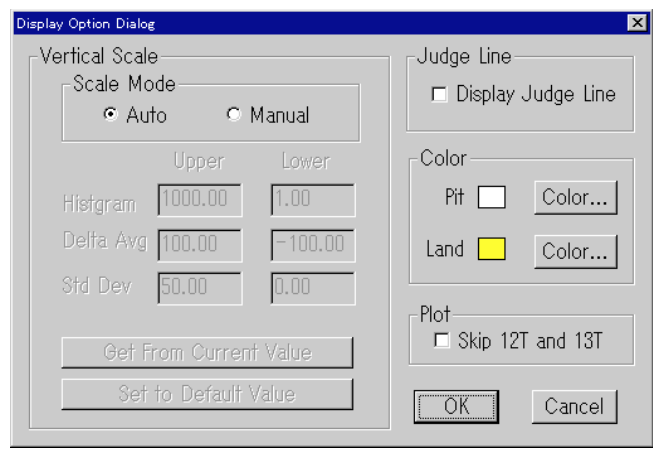
3.2 Setting the Display Color

Procedure

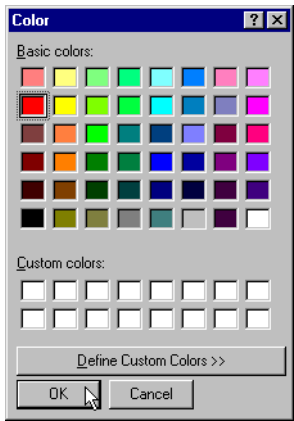
1. Click "Display" to display the Display menu.
2. Click "Display Option" to display the Display Option dialog box.



3. Click the "Color" button located to the right of Pit or Land under "Color" in "Vertical Scale."



4. Set the color. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button. The screen returns to the display option dialog box.



5. To activate the settings in the display option dialog box, click the "OK" button. To cancel, click the "Cancel" button.

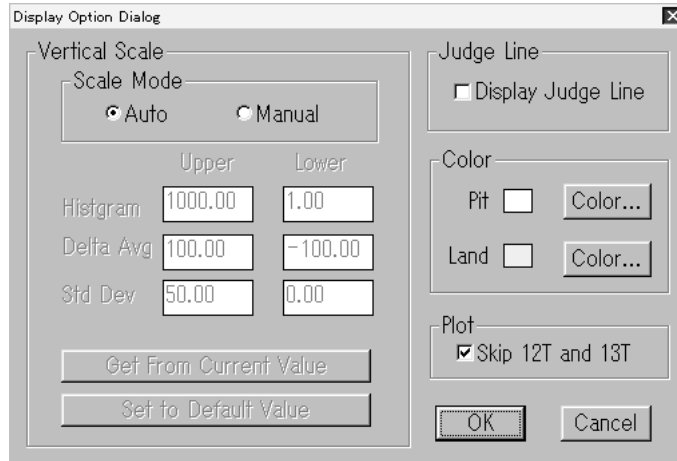
Explanation

You can set the displayed color of the plot of the Pit/Land signal graph. You can select any of the 48 basic colors or a color that you created. For details, see the instruction manual that came with your operating system. The colors that can be displayed vary depending on the graphic accelerator that is installed in your PC.

3.3 Displaying or Not Displaying 12T and 13T

Procedure

1. Click "Display" to display the Display menu.
2. Click "Display Option" to display the Display Option dialog box.
3. If you check the "Skip 12T and 13T" box in the "Plot" frame, 12T and 13T are not drawn. "11T" and "14T" are linearly interpolated.



Explanation

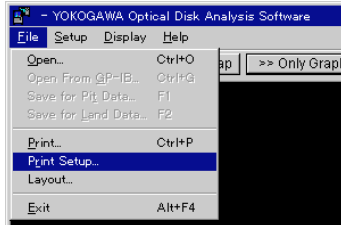
You can select whether or not to draw the 12T and 13T data (Delta average and standard deviation).

If you do not need the 12T and 13T data to be drawn such as with a DVD, check "Skip 12T and 13T."

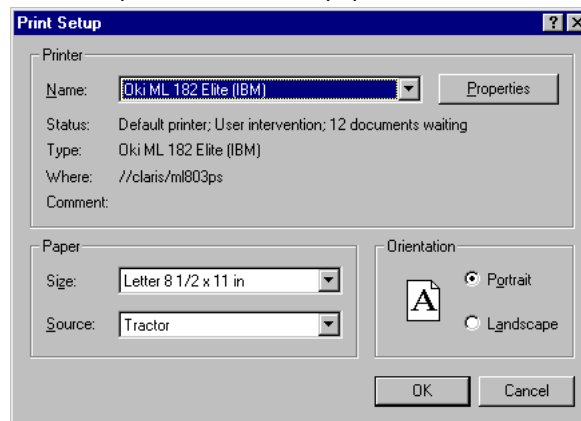
4.1 Setting the Printer

Procedure

1. Click "File" to display the File menu.
2. Click "Print Setup" to display the printer setup dialog box.



3. Select the printer, orientation, paper size, etc.



4. To activate the settings, click the "OK" button. To cancel, click the "Cancel" button.

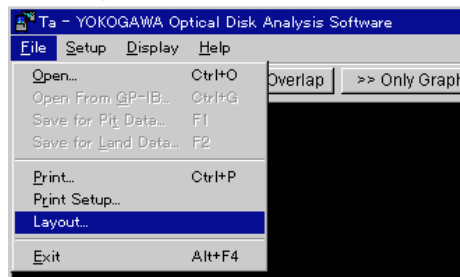
Explanation

Setting the printer

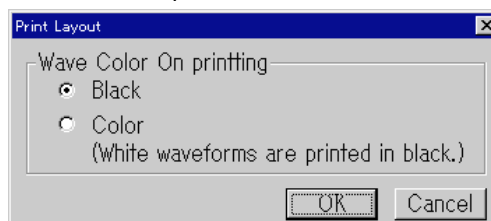
Set the printer according to the system environment that you are using.

Setting the waveform colors when printing in color

Click "Layout" from the file menu.



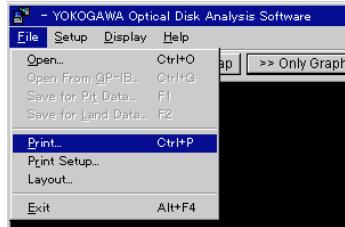
If you select "Color," the waveform will be printed in color. In this case, the white waveforms are printed in black.



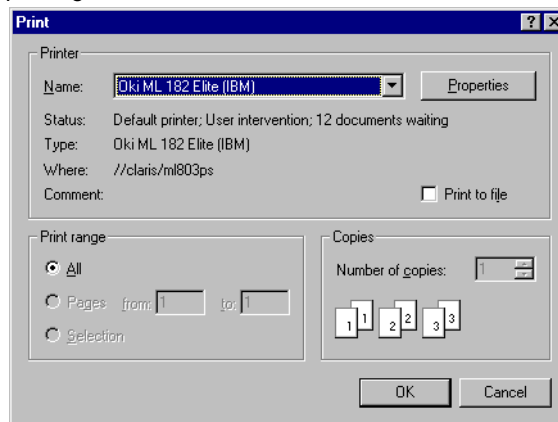
4.2 Printing

Procedure

1. Click "File" to display the File menu.
2. Click the "Print" button to display the print dialog box.



3. Confirm the settings in the print dialog box and click the "OK" button to execute printing. To cancel, click the "Cancel" button.



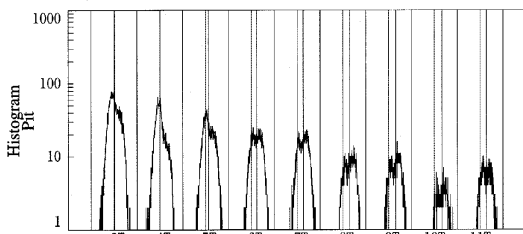
Explanation

Print example

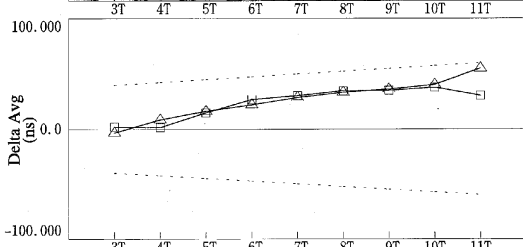
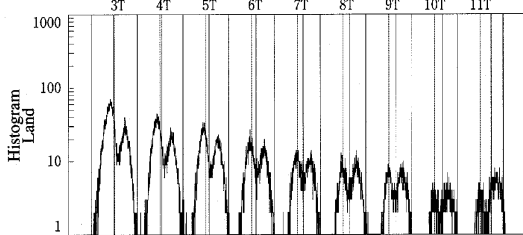
See "Display example" in section 2.1, also.

Date&Time Pit : (95/09/27 11:24:00)
Land : (95/09/27 11:27:41)

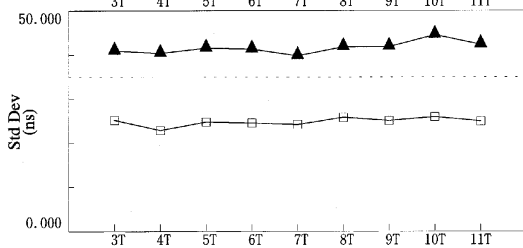
— Window (Theoretical Value)
— Average(Theoretical Value)
- - - Average(Calculated Value)
3T to 11T (T=230.000nsec)



T	Pit Avg	Land Avg
3T	690.000	690.000
4T	920.000	920.000
5T	1150.000	1150.000
6T	1380.000	1380.000
7T	1610.000	1610.000
8T	1840.000	1840.000
9T	2070.000	2070.000
10T	2300.000	2300.000
11T	2530.000	2530.000



T	Pit (ns)	Land (ns)
3T	1.950	-3.300
4T	1.550	8.550
5T	14.800	16.200
6T	27.000	22.100
7T	30.450	28.700
8T	34.950	33.550
9T	35.250	36.300
10T	38.000	40.450
11T	30.600	55.100



T	Pit (ns)	Land (ns)
3T	25.258	40.920
4T	22.912	40.361
5T	24.821	41.525
6T	24.575	41.305
7T	24.240	39.785
8T	25.865	41.797
9T	25.153	41.864
10T	25.982	44.489
11T	25.013	42.353

Pit : □ Land : △

Optical Disk Analysis Software - AAAAA.WVF BBBBB.WVF

Specifications

Software

This software application (704216) is the executable file named Ta520.exe.

Measurement data that are handled

- Data measured using the hardware histogram mode on the Time Interval Analyzer TA320/TA520.
 - Data above that have been saved to a binary file (.wvf extension) along with the header file (.hdr extension).
 - Data that have been measured by the TA320/TA520 and loaded into this software application via the communication interface (GP-IB).
(You cannot use this software application to load (or read) data from the TA320/TA520's floppy disk drive via GP-IB.)
- Binary format data that have been saved using this software application (.tad extension)

Data display

- Log or linear scale can be selected for the histograms
- Displays graphs and tables of Delta average and standard deviation.
- Upper and lower limits of the scale can be specified.
- Judge line display
- Set judgement values for Delta average and standard deviation and display the judge line on the graph.

Print function

Prints histograms as well as graphs and tables of Delta average and standard deviation.

System Requirements

PC

PC capable of running Windows 95/98 or Windows NT 4.0 with at least 16 MB of RAM

Operating System

Windows 95/98 or Windows NT4.0

GP-IB board

A GP-IB board made by National Instruments must be installed in the PC.

CRT, printer, and mouse

Those supported by Microsoft Windows 95/98 or Windows NT 4.0.