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OF THE FISHERIES ON LAKE
TANGANYIKA

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OPERATION MANUAL FOR AANDERAA SOFTWARE

by

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FOOD AND AGRICULTURE ORGANIZATION
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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika project (LTR) became fully operational in January 1992. It is executed by the Food and Agriculture Organization of the United Nations (FAO) and funded by the Finnish International Development Agency (FINNIDA).

LTR's objective is the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake-wide fisheries management policy for the four riparian States (Burundi, Tanzania, Zaïre and Zambia)

Particular attention is given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the buildup of effective coordination mechanisms to ensure full collaboration between the Governments concerned.

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1 INTRODUCTION

This new Aanderaa-software has been developed to unload the data from the Aanderaa instruments, e.g., weather stations and thermistor strings. It is easy to use and it includes also data analysis. All the information is saved into five databases:

1. Projects database
2. Devices database
3. Sensors database
4. Measurements parameters
5. Current sensors

Once you have written all the information to the databases 1-3 you only have to change them when a sensor is changed or a new device is installed. Every time a Data Storage Unit (DSU) is read you have to add new information to databases 4 and 5.

2 GETTING STARTED

2.1 Installation

Obs.! All the files should be copied to the **drive c: .**

Create **Aanderaa**-directory to the drive c: with command **md aanderaa** and copy there all the files from the **disk1** with command **copy a: \ *.* c:\aanderaa**. The *.dll should also be copied to windows-directory and bwcc.dll also to the root-directory.

Create **Pdowin**-directory to the drive c: by writing **md pdowin** and move into that directory by writing **cd pdowin**. Create a **Private**-subdirectory to the c:\pdowin-directory with command **md private** and copy there all the files from the **disk2** with command **copy a:\ *.* c:\pdowin\private**.

When you have created all the directories and copied all the files add the following lines to the **Win.ini** -file after the [fonts]-option:

```
[Paradox Engine]
UserName=PxEEngine
NetNamePath=C:\PDOXWIN\PRIVATE
NetType=2
ShareLocal=YES
PX35Locking=NO
MaxTables=60
RecBufs=200
MaxLocks=64
MaxFiles=100
SwapSize=256
```

Add following lines to your **autoexec.bat** -file and reboot your computer (check that these files are in the C:\DOS-directory):

```
c:\dos\smartdrv.exe c+
c:\dos\share.exe
```

Start Windows and choose **File -> New**. Choose **Program group** from the **New Program Object**-window and click **OK**. Now you get a new window. Write to the line **Description** Aanderaa and click **OK**.

Choose the **Aanderaa**-window and click **File -> New**. Choose **Program** from the **New Program Object**-window and click **OK**. Now there is another new window open. Add there the following lines:

| | |
|--------------------|------------------------|
| Description: | Aanderaa |
| Command line: | c:\aanderaa\dinput.exe |
| Working directory: | c:\aanderaa |

and click **OK**.

Obs.! If you have a **Paradox for Windows**-program in your computer, start from the **Paradox**-group window **Configuration Utility** -program by double clicking its icon. Check that your Network Control File Directory is C:\PDOXWIN\PRIVATE and your Local Share is On.

You can start the program by double clicking the Aanderaa icon.

2.2 Unloading the data storing unit

Unloading is done as told in the project's field manual (Kotilainen, 1994). Connect the DSU-reader into the data storage unit (DSU) as well as your computer's COM1 port. Plug cable no. 2842C from DSU-reader into the DSU, cable no. 3016A with the extension into your computer's port and power cable for DSU-reader. Open the **Communications**-window by clicking **Window -> Communications**. Choose then **Input -> From DSU** and after that, choose **DSU commands -> Reset DSU**.

Obs.! If you want to change the communication parameters choose **Communications**-window and choose the right parameters with the mouse.

Choose **Input -> Start** and the program unloads the data storing unit. Unloading will stop automatically. Check that the numbers are diminishing in the DSU display. If you want to interrupt data unloading choose **Input -> Stop**. (to unload a full DSU takes about 50 minutes!). If you choose **Input -> Log to a file** before you start unloading program will make a similar file as your raw data file. You can turn the logging off by choosing **Input -> Turn logging off** and delete logfile by choosing **Input -> Clear log file**.

If you want to erase DSU, choose **DSU commands -> Erase DSU**. This is not recommendable until you have checked that the data is OK. You can also test DSU by choosing **DSU commands -> Run DSU internal test** and check that the time is right by choosing **DSU**

commands -> Change and display DSU real time clock.

After the DSU is unloaded choose **Raw data editor** -window by clicking **Window -> 4 RAW data editor**. Check that the cursor is at the beginning of the file and delete all the time information by clicking **Edit -> Delete time information**. When this is done, the program will show you the number of deleted lines with time information. After that you can check possible errors in the data by choosing **Find -> Find next error**. **Commands mark data** and **Clear marks** are not in function.

The cursor will stop to the point where there is an error and you have to do the corrections manually. If the cursor stops at the end of file it means that there is an empty line and it must be removed. You can delete a line by choosing **Edit -> Delete line**.

2.3 Reading the ASCII-file

If you have already unloaded the data you can read the ASCII-files into the program. Open **Raw data editor** -window by choosing **Window -> 4 Raw data editor**. Choose **File -> Load from ASCII file**. You will see a window where you can select the right directory and a file.

Data handling (deleting time information and finding errors) after this is done the same way as if you had read the DSU.

3 PROJECTS DATABASE

Open the projects database by choosing **Window -> 1 Projects database**.

3.1 Adding to the projects database

Add a new project by writing it's information on top of the old information (the old information will not disappear).

3.1.1 Fields

| | |
|---------------------------|---|
| Project name | name of the project |
| Project number | number of the project |
| Project start time | project's starting date (in format yy:mm:dd) |
| End time | project's ending date (in format yy:mm:dd) |
| Project manager | name of the project's manager not in function |
| Comments | free format text, the length of the |

field is 255 marks and you can move into the field only by using mouse!

Total project records number of records in the database, **automatic**

Record ordinal number of the record, **automatic**

Add the information by choosing **Command -> Add**. If you want to delete old project information you can choose **Command -> Delete**.

3.2 Changing the projects database

If the project exist but its information has changed type new information on top of the old information and choose **Command -> Add**. You can get a new window where you are asked to confirm the change. Accept by clicking **OK**.

4 DEVICES DATABASE

Open the devices database by choosing **Window -> 5 Devices database**.

4.1 Adding to the devices database

Add a new device by typing it's information on top of the old information (the old information will not disappear).

4.1.1 Fields

Serial number serial number of the device

Type type number of the device

Name name of the device

Remarks free format text the length of the field is 255 marks and you can move into the field only by using mouse!

Current record order number of the record, **automatic**

Records number of devices in the database, **automatic**

4.2 Changing the devices database

If the device exists but its information has changed type new information on top of the old information and choose **Command -> Add**. One can get a new window where you are asked to confirm the change. Accept the change by clicking **OK**.

5 SENSORS DATABASE

Open the sensors database by choosing **Window -> 6 Sensors database**.

5.1 Adding to the sensors database

Add a new sensor by typing its information on top of the existing information (the old information will not disappear).

5.1.1 Fields

| | |
|--------------------------|---|
| Serial no | serial number of the sensor. If the sensor do not have a serial number type as follows: D + number of device (the device that the sensor is connected) + channel (the channel that the sensor is connected). For example D27002 means that the sensor is connected to a device, which has a serial number 2700 and into a channel number 2. |
| Version | It is usually 1 , but if the calibration coefficients will change the serial number will remain the same and the version number will be 2 . |
| Type | type number of the sensor |
| Calibration place | the country where the sensor was calibrated |
| Date | calibration date if the sensor (in format yy:mm:dd) |
| K1-K4 | calibration coefficients |
| Formula | Choose one of the three formulas by clicking the arrow pointing downwards. |

If the calibration coefficients are K1, K1 and K2 or K2, one can choose the first formula.

If one of the calibration coefficients is K3, choose formula two.

If one of the calibration coefficients is K4, choose formula three.

Min minimum value of the sensor

Max maximum value of the sensor

E.g. if the sensor is measuring wind direction the minimum value

will be 0 and maximum value 360.

Precision not in function

**Sensor is connected
to a device**

number of the device (the device where the sensor is connected). **Obs.!** The device must be found from the Devices database.

Channel

number of the channel (where the sensor is connected)

**Measurement
type**

measured variable e. g. wind speed

Dimension

unit of the measured variable e. g. m/s

Type of time series is not in function

Maintenance

free format text the length of the field is 255 marks and you can move there only by mouse!

Record

order number of the records, **automatic**

**No of
records**

number of records in the database, **automatic**

Add information by choosing **Command -> Add**.

5.2 Changing the sensors database

If the sensor exist but its information has changed write new information on top of the old information and choose **Command -> Add**. You can get a new window where you are asked to confirm the change. Accept by clicking **OK**.

6 MEASUREMENT PARAMETERS

6.1 Adding to the measurement parameters

Open the **Measurement parameters** -window by clicking **Window -> Measurement parameters**. Click **New**-button and fill the fields. One can move between fields with the tabulator or the mouse.

6.1.1 Fields

| | |
|--|--|
| ID | automatic |
| Place name | location of the measurement device e.g. Kigoma |
| Interval | recording interval in seconds |
| Map no | number of the map where the measurement point is situated |
| Navigational map | number of the navigational map where the measurement point is situated |
| Latitude | latitude of the measurement point in degrees, minutes and seconds |
| Longitude | longitude of the measurement point in degrees, minutes and seconds |
| <p>By clicking the two arrows at the end of latitude and longitude fields one can open a "box" where one can choose the unit to the latitude and longitude fields:</p> | |
| NO LAT | northern latitude |
| SO LAT | southern latitude |
| EA LON | eastern longitude |
| WE LON | western longitude |
| Start time | measurement starting time |
| End time | ending time for the measurement |
| First sample | the real first measurement time (when the measurement device is installed to its position) |
| Last sample | time of the last recording (before the measurement device is removed) |
| No of measurements | number of measurements in the database, automatic |
| Size of measurement data | automatic |
| Current record | the order of the record, automatic |
| Last update | saving date, automatic |
| Comments | free format text, the length of the field is 255 marks and one can move there only by mouse! |

6.2 Saving the measurement

When all the information concerning the measurement were added, one has to choose the right sensors. There are two different ways to do this. Easiest way is to open **Devices database** by clicking **Window -> 5 Devices database** and **Current sensors**-window by clicking **Window -> 3 Current sensors**. Get the right device by rolling the sidebar downwards. Once the right device was found, place the mouse arrow into the background of the window (not on top of any field) and press left mouse button. Keep the button down and drag the arrow to the **Current sensors**-window on top of channel number two. Release the button and the sensors information will transfer to the right channels and a checkmark will appear in front of the channels. If you don't want to choose all the sensors you can remove the checkmark in front of those sensors before you save the measurement.

The other way of transferring the sensors information into the **Current sensors**-window is to choose them one at a time from **Sensors database**. Choose the right sensor from the Sensors database by rolling the sidebar downwards. When you have found it place the mouse arrow into the background (not on top of any field or grey area) and press left mouse button. Keep the button down and drag the mouse to the **Current sensors**-window and on top of that channel where the sensor is connected. release the button and the sensors information will transfer into that line and a checkmark will appear in front of that channel. Move similarly all the sensors that are connected to the measurement device.

Move back to the **Measurement parameters**-window and choose **Command -> Add current measurement to database**. Before saving the measurement information the program will once again check the raw data. If it finds any errors the information will not be saved. If everything is correct you will get a message "no more errors", accept the message by clicking OK. If you choose **Command -> Save measurement to FYS file** the program will change your raw data to real values and save it.

6.3 Changing the measurement parameters

If the measurement exists but its information has changed write new information on top of the old information and choose **Command**

-> Add current measurement to database. You can get a new window where you are asked to confirm the change. Accept by clicking **OK**.

7 CURRENT SENSORS DATABASE

Open **Measurement parameters** -window by choosing **Window -> 7 Measurement parameters**. Choose the right measurement by rolling the sidebar. After this open the **Current sensors**-window by choosing **Window -> 3 Current sensors** and change the window size so that all the fields are visible. Open the **Graphics**-window by choosing **Window -> 8 Scalar plotting window**.

Select the **Current sensors** -window and choose type of measurement (e.g. temperature). Move the mouse cursor into the temperature row and press left button down. Keep it down and drag the mouse cursor into the **Graphics**-window (**Scalar plotting window**) and release the button. The program will draw the picture automatically.

You can add six lines into the same picture. If you want a new window move into the **Graphics**-window and choose **New**.

When you are in the **Graphics**-window and press the right mouse button you can get a pop-up list where you can choose how the picture is plotted. If you choose **Plot lines**, the picture is drawn as a **line** and if you choose **Plot points**, as **points**. You can also set line width to one pixel.

7.1 Introduction

| | |
|------------------------|--|
| Average | It can be a scalar picture or a vector picture. Look more details from the chapter 7.2 Average value picture, page 9. |
| Component | It can only be a vector picture. Look more details from the chapter 7.3 Component picture, page 10. |
| Distribution | It can be a scalar picture. Look more details from the chapter 7.4 Distribution picture, page 10. |
| Vector | It can only be a vector picture. look more details from the chapter 7.5 Vector picture, page 11. |
| Interval | It can be a scalar or a vector picture. You define the time interval from the pop-up list that opens when the mouse cursor is in the time row and you press the right mouse button. |
| Gauss smoothing | It can be a scalar picture. It removes "peaks". |
| ASCII import | not yet in function |

Obs.! If there are both positive and negative numbers in the time series the 0-level line will be drawn automatically to the picture. if the values are only either positive or negative the 0-line will not be drawn.

If the type of measurement is direction the horizontal lines of the picture will go from 0 to 360.

7.2 Average value picture

Open **Measurement parameters** -window by choosing **Window -> 7 Measurement parameters**. Choose the right measurement by rolling the sidebar. After this open the **Current sensors**-window by choosing **Window -> 3 Current sensors** and change the window size so that all the fields are visible. Open the **Graphics**-window by choosing **Window -> 8 Scalar plotting window**.

Select the **Current sensors**-window and choose type of measurement (e.g. conductivity). Move the mouse cursor into the conductivity row and press left button down. Keep it down and drag the mouse cursor to the **Average**-row and release the mouse button. Text will now appear at the end of means word. Move the cursor on top of the text and press the right mouse button. You can get a pop-up list where you can give the average value interval in minutes. Confirm by clicking **OK**.

Move the mouse cursor on top of the text and press left mouse button. Keep it down and drag the cursor into the **Graphics**-window (**Scalar plotting window**) and release the button. The program will draw the picture automatically.

If you want to change the average value interval move the cursor on top of the text and press right mouse button. Change the interval and confirm with **OK**. Move the text into the **Graphics**-window as told previously. The program will ask you whether you want to add a line. if you answer yes the line will be drawn into the same picture with previous line. But if you answer no the line will be drawn into a separate picture.

Obs.! If you are calculating the average values of rainfall remember that it is measured as the total rainfall between sample. (If the recording interval is 10 minutes, the one hour means are actually means per 10 minutes). So if you calculate 1 hour means you have to multiply means by 6.

7.3 Component picture

Open **Measurement parameters** -window by choosing **Window -> 7 Measurement parameters**. Choose the right measurement by rolling the sidebar. After this open the **Current sensors**-window by choosing **Window -> 3 Current sensors** and change the window size so that all the fields are visible. Open the **Graphics**-window by choosing **Window -> 8 Scalar plotting window**.

Move into the **Current sensors**-window and move the mouse cursor into the **Direction**-row and press the left mouse button down and keep it down. Drag the cursor into the **Component**-row and release the button. You will get a pop-up window where you are told that the chosen series must be a vector. Confirm with **OK**. Do the same thing to the **Speed**-row. The program will now ask you if you want to create a vector. Answer yes and you can draw a component picture.

The direction of the component can be defined from the pop-

up list that opens when you move the cursor on top of the text row and press right mouse button. When you move the text into the **Graphics**-window the program will draw you a component picture.

7.4 Distribution picture

Open **Measurements parameters** -window by choosing **Window -> 7 Measurements parameters**. Choose the right measurement by rolling the sidebar. After this open the **Current sensors**-window by choosing **Window -> 3 Current sensors** and change the window size so that all the fields are visible. Open the **Graphics**-window by choosing **Window -> 8 Scalar plotting window**.

Select the **Current sensors**-window and choose type of measurement. Move the mouse cursor into the chosen row and press left button down. Keep it down and drag the mouse cursor to the **Distribution**-row and release the mouse button. Text will now appear at the end of distribution word. Move the cursor on top of the text and press the right mouse button. You can get a pop-up list where you can give classes. Confirm by clicking **OK**.

Move the mouse cursor on top of the text and press left mouse button down. Keep it down and drag the cursor into the **Graphics**- window (**Scalar plotting window**) and release the button. The program will now automatically draw the picture. Numbers on top of the picture will tell you the percentages.

7.5 Vector picture

Open **Measurements parameters** -window by choosing **Window -> 7 Measurements parameters**. Choose the right measurement by rolling the sidebar. After this open the **Current sensors**-window by choosing **Window -> 3 Current sensors** and change the window size so that all the fields are visible. Open the **Graphics**-window by choosing **Window -> 8 Scalar plotting window**.

Move into the **Current sensors**-window and move the mouse cursor into the **Direction**-row and press the left mouse button down and keep it down. Drag the cursor into the **Average**-row and release the button. Do the same thing with the **Speed**-row. The program will ask you if you want to create a vector. If you answer no you can only draw an average value picture of the speed. If you answer yes you can draw a vector picture by dragging the text into the **Graphics**- window. Also in this picture you can give the average value interval.

The vertical axis of the vector picture is north and the horizontal axis is east. The maximum length of the speed is from the horizontal axis on top of the vertical axis.

By pressing the right mouse button you choose to split the time (x) axis into two graphs. The program will do the splitting automatically.

8 PICTURE PRINTING

Move into that **Graphics**-window that you want to print. Choose **Print -> Print**. The picture will be printed to the chosen printer. **Printer setup** is not in function.

You can also print the picture into a table format. Choose **Print -> Convert to numeric table**. You will see a pop-up window where you can define the destination and name of the table. The table can be printed from DOS.

9 TROUBLESHOOTING AND COMMENTS

You may have difficulties running this program if you have only 4 MB of RAM in your computer and if you don't have a math coprocessor. This is a problem especially when you are drawing vector pictures. However if you have saved the all the information nothing is lost and you can start the program again.

This program uses quite a lot of memory and you may have difficulties running other windows-programs after you have used Aanderaa-program. Best thing to do then is to end windows and start it again.

We would like to have your comments about Aanderaa-program and this manual. The program will be developed further.

We accept wishes, comments of errors in the program etc. If the program will crash write down what you were doing and what message did you get and send the information to us.

Comments can be send to address:

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REFERENCES

Kotilainen, P. Field notes for hydrodynamic.
1993 FAO/FINNIDA Research for the of the Fisheries on Lake
 Tanganyika.
 GCP/RAF/271/FIN-FM/10 (En): 58p.